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FINAL RISK ASSESSMENT RE-EVALUATION OF SOILS AT SITES 9, 10, 11, 12, 13, 14, 15, 16, 17, AND 18 NAS WHITING FIELD FL

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TETRA TECH NUS

Comprehensive Long-term Environmental Action Navy

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Risk Assessment Re-Evaluation of Soils
for
Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18

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Naval Air Station Whiting Field
Milton, Florida
USEPA ID No. FL2170023244

Contract Task Order 0079

September 2006

NAVFAC
Naval Facilities Engineering Command
Southeast
2155 Eagle Drive
North Charleston, South Carolina 29406

TETRA TECH NUS, Inc.

RISK ASSESSMENT RE-EVALUATION OF SOILS FOR SITES 9, 10, 11, 12, 13, 14, 15, 16, 17, AND 18

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
USEPA ID No. FL2170023244

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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ACRONYM LIST

ABB-ES	ABB Environmental Services
ACH	Air Changes per Hour
AFFF	Aqueous Film Forming Foam
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
AVGAS	Aviation Gas
BAFs	Bioaccumulation Factors
BCF	Bioconcentration Factor
BERA	Baseline Ecological Risk Assessment
bgs	Below Ground Surface
BSAF	Biota Sediment Accumulation Factors
BRAC	Base Re-alignment and Closure
BTAG	Biological Technical Assistance Group
C_{sat}	Saturation Concentration
cPAH	Carcinogenic PAHs
Cal EPA	California Environmental Protection Agency
CCME	Canadian Council of Ministers of the Environment
CD	Compact Disk
CDI	Chronic Daily Intake
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CLEAN	Comprehensive Long-Term Environmental Action Navy
CMS	Corrective Measures Study
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CRAVE	Carcinogenic Risk Assessment Verification Endeavor
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CTO	Contract Task Order
CTL	Clean-up Target Level
DA_{event}	Absorbed Dose per Event
DAF	Dilution and Attenuation Factor
DOD	Department of Defense

Eco-SSL	Ecological Soil Screening Level
EDQL	Ecological Data Quality Level
EEQ	Ecological Effects Quotient
Eh	Redox Potential
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ER-L	Effects Range-Low
ER-M	Effects Range-Median
EU	Exposure Unit
FAC	Florida Administrative Code
FCM	Food Chain Modeling
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
F_{oc}	Fraction of Organic Carbon
g	Gram
GIR	General Information Report
HEAST	Health Effects Assessment Summary Tables
HH	Human Health
HHRA	Human Health Risk Assessment
HI	Hazard Index
HLA	Harding Lawson Associates
HQ	Hazard Quotient
HSDB	Hazardous Substance Database
i	Hydraulic Gradient
IA	Installation Assessment
IAS	Installation Assessment Study
ILCR	Incremental Lifetime Cancer Risk
IEUBK	Integrated Exposure Uptake Biokinetic Model for Lead
IR	Installation Restoration
IRIS	Integrated Risk Information System
K	Hydraulic Conductivity
K_d	Soil-Water Distribution Coefficient
K_{oc}	Organic Carbon-Water Partition Coefficient
K_{ow}	Octanol-Water Partition Coefficient
LOAELs	Lowest-Observed-Adverse-Effect Levels
LOEC	Lowest-Observed-Effects Concentration
MADEP	Massachusetts Department of Environmental Protection

MCL	Maximum Contaminant Level
MDL	Maximum detection Limit
meq	Milliequivalents
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MHSPE	Ministry of Housing, Spatial Planning and Environment
MI	Mobility Index
mL	Milliliters
MRL	Minimum Risk Levels
NA	Not applicable
NAS	Naval Air Station
NAVFAC	Naval Facilities
NCEA	National Center for Environmental Assessment
NOAA	National Oceanic and Atmospheric Administration
NOAELs	No-Observed-Adverse-Effects Levels
NOEC	No-Observed-Effects Concentration
NTU	Nephelometric Turbidity
OPPTS	Office of Prevention, Pesticides, and Toxic Substances
ORNL	Oak Ridge National Laboratory
ORP	Oxidation-Reduction Potential
OSWER	Office of Solid Waste and Emergency Response
OVA	Organic Vapor Analyzer
PAH	Polycyclic Aromatic Hydrocarbon
PCE	Tetrachloroethene
PCB	Polychlorinated Biphenyl
PEF	Particulate Emission Factor
PID	Photoionization Detector
PRG	Preliminary Remediation Goal
PPRTV	Provisional Peer Reviewed Toxicity Values
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RAIS	Risk Assessment Information System
RBC	Risk-Based Concentration
RBCAP	Risk Based Corrective Action Process
RCRA	Resource Conservation and Recovery Act
RGO	Remedial Goal Option

RfC	Reference Concentration
RFD	Reference Dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
S	Solubility
SCTL	Soil Clean-up Target Level
SLERA	Screening-level Ecological Risk Assessment
SMDP	Scientific/Management Decision Point
SOP	Standard Operating Procedure
SQG	Soil Quality Guideline
SOUTHDIV	Southern Division
SQL	Sample Quantitation Limit
SSLs	Soil Screening Levels
SVOC	Semi-volatile Organic Compounds
SUF	Site Use Factor
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TEF	Toxicity Equivalence Factor
TOC	Total Organic Carbon
TOM	Task Order Manager
TRPH	Total Recoverable Petroleum Hydrocarbons
TRVs	Toxicity Reference Value
TRW	Technical Review Workgroup
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper Confidence Limit
UET	Upper Effects Threshold
US EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTL	Upper Tolerance Limit
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
VF	Volatilization Factor
VOC	Volatile Organic Compound
VP	Vapor Pressure
WRS	Wilcoxon Rank Sum

EXECUTIVE SUMMARY

This risk assessment report provides a re-evaluation of the risk assessments of soils presented in the remedial investigation (RI) reports previously prepared for Sites 9 through 18 at the Naval Air Station (NAS) Whiting Field, Milton, Florida. The original risk assessments were conducted by Harding Lawson Associates (HLA) in 1999 and 2000. The risk assessments and associated RIs are part of environmental investigations conducted by Naval Facilities Field Division South as part of the Department of Defense (DoD) Installation Restoration (IR) program. The IR program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations.

The risk assessments originally prepared in 1999 and 2000 were re-evaluated primarily because of changes in the risk assessment protocols and guidance recommended by the United States Navy and the United States Environmental Protection Agency (USEPA) since 2000, and because of proposed, significant changes in State of Florida Department of Environmental Protection (FDEP) regulations potentially impacting remedial decisions Sites 9 through 18.

The risk assessments included in this report provide a re-evaluation of the analytical data available for surface and subsurface soils only. The risk assessment of analytical data for groundwater will be provided separately in the Site 40 RI Report. A re-evaluation of risk estimates for surface waters and sediments was not required because minimal contamination was detected in the surface water samples reported in the original RI reports, sediment samples were not collected at any of the sites under investigation, and there are no permanent surface water bodies in the immediate vicinity of Sites 9 through 18.

Human health risk assessment (HHRA) re-evaluations are provided for soils at Sites 9 through 18. However, the ecological risk assessments (ERAs) presented in the original RI reports for Sites 11 and 16 only are updated. The ERAs for Sites 9, 10, 12, 13, 14, 15, 17, and 18 did not require a risk assessment re-evaluation either because no chemicals of potential concern for ecological receptors were identified in the original RIs or because an interim action eliminating an ecological risk assessment concern was conducted for the site.

E.1 RISK ASSESSMENT SUMMARY FOR SITE 9, WASTE FUEL DISPOSAL PIT

A HHRA was conducted for the chemical concentrations detected in five surface soil samples collected at Site 9. A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of the site in 1999 (Bechtel, February 2000). Consequently, the surface soil data evaluated in the risk assessment actually represent the shallow subsurface soils underlying this permeable cap.

Antimony was the only chemical selected as a chemical of potential concern (COPC). No chemicals were selected as potential chemicals of concern (COCs) for further evaluation in a Feasibility Study. However, this assessment was limited to an evaluation of analytical data for surface soils; subsurface soil samples have not been collected at Site 9.

E.2 RISK ASSESSMENT SUMMARY FOR SITE 10, SOUTHEAST OPEN DISPOSAL AREA A

A HHRA was conducted for the chemical concentrations detected in 11 surface soil and three subsurface soil samples collected at Site 10. A 24-inch permeable soil layer and native grass cover was emplaced over the surface soil of Site 10 in 1999 (Bechtel, February 2000); consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying the permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction or excavation activities bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Several organics [primarily the carcinogenic polyaromatic hydrocarbons (cPAHs), dieldrin, and two Aroclors] and two inorganics (barium and chromium) were selected as COPCs for surface soil and were evaluated in the quantitative HHRA conducted per USEPA guidelines. Two pesticides (aldrin and dieldrin) and two inorganics (antimony and chromium) were selected as COPCs for subsurface soil and were also evaluated per USEPA guidelines. The non-cancer risk estimates [i.e., the hazard indices (HIs)] did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although cancer risk estimates developed for four of the five receptors evaluated (the hypothetical future resident, the typical industrial worker, the construction worker, and the recreational user) exceed the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the cPAHs; chemical-specific risk estimates for all other COPCs approximate or were less than 1×10^{-6}. The only risk driver for subsurface soils was chromium (construction worker only); chemical-specific risk estimates for all other COPCs were less than 1×10^{-7}. However, the construction worker was evaluated in a very conservative manner; risk estimates for this receptor are likely to be overestimated.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published FDEP soil clean-up target levels (SCTLs) for the residential and industrial land use scenario, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of exposure point concentrations (EPCs) to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	cPAHs	cPAHs
Barium		
TRPH		

Over 90 percent of the estimated cancer risk is attributable to cPAHs. The total cancer risk estimates for the industrial and recreational land use scenarios would not exceed 1 x 10^{-6} if cPAHs were not detected or were only detected at concentrations approximately equal to the SCTLs. The TRPH and barium concentrations exceeding the relevant SCTLs were reported for samples also demonstrating cPAH concentrations exceeding the SCTLs.

E.3 RISK ASSESSMENT SUMMARY FOR SITE 11, SOUTHEAST OPEN DISPOSAL AREA B

An HHRA was conducted for the chemical concentrations detected in 47 surface soil and three subsurface soil samples collected at Site 11.

Several organics [benzo(a)pyrene, 4,4-DDT, alpha chlordane, gamma-chlordane, dieldrin, heptachlor, heptachlor epoxide], lead, and TRPH were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. Two pesticides (aldrin, dieldrin), two PCBs (Aroclor-1254 and Aroclor-1260), and cadmium were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., the HIs) did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although the cancer risk estimate developed for the COPCs for surface soil for one of the five receptors evaluated (the hypothetical future resident) exceeded the State of Florida cancer risk benchmark of 1 x 10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1 x 10^{-4} to 1 x 10^{-6}. The primary risk driver for surface soils was dieldrin; chemical- specific risk estimates for all other COPCs are less than 1 x 10^{-6}. The risk evaluation of lead concentrations detected in the Site 11 surface soils indicates exposure to average lead concentration in the surface soils would not result in blood lead concentrations exceeding USEPA benchmarks. However, the lead concentration reported for one surface soil location (11-SL-02, 2,230 mg/kg) is five times the USEPA action level for residential land use (400 mg/kg). Extensive surface soil sampling for lead in the immediate vicinity of location 11-SL-02 suggests a very limited area of lead contamination.

The risk assessment conducted using the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published FDEP soil clean-up target levels (SCTLs) for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and exposure point concentrations (EPCs) to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Dieldrin	None	None
Lead		

No chemicals were identified as potential chemicals of concern (COCs) for subsurface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

The exceedances of SCTLs for the hypothetical future resident exposed to surface soils are primarily associated with samples from location 11-SL-02 (the lead hot spot location), location 11-SL-04, and the confirmation samples associated with the 11-SL-04 removal action. Greater than 50 percent of the estimated cancer risk for the surface soils is attributable to dieldrin. As discussed in Appendix J of the 2000 RI report (Results of Additional Soil Sampling at Site 11, CH2M Hill, February 23, 2000), the surface soil removal action in the vicinity of 11-SL-04 did not result in soils concentrations less than residential SCTLs. However, lead and dieldrin were the only potential COCs detected in surface soils at concentrations exceeding the non-apportioned FDEP SCTLs for residential land use. The exceedances of SCTLs for the hypothetical future resident exposed to subsurface soils are primarily associated with the subsurface sample from test pit TP-11-01 located in the general vicinity of location 11-SL-02 (the lead hot spot location).

A screening level ecological risk assessment including Step 3A has been completed for surface soil at Whiting Field Site 11. Following an initial screening step where maximum site concentrations of contaminants were compared to conservative screening values, a list of COPCs was developed. COPCs consisted of pesticides and metals. One VOC and one SVOC were also retained as COPCs in the absence of applicable screening values. Bioaccumulative COPCs were analyzed in a food chain model to evaluate potential risks associated with consumption of contaminated food. The results of the food chain model indicated potential risks were primarily limited to lead. The list of COPCs was refined through an evaluation of spatial distribution, frequency of detection and detection limits, receptor home range, constituent bioavailability, and background. Additionally, COPC concentrations were compared to a variety of soil guidelines to reduce the uncertainty associated with using very conservative screening values, and to assist in characterizing spatial distribution of potential risk. The results of the refinement analyses indicated chlorinated pesticides, lead and zinc contribute the most to site-related risk. Sample 11SO4801 may represent a localized area of elevated risk from alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide. An approximately 0.63 acre area of chlorinated pesticide contamination may be present bounded by sample locations 11-SL-02, 11-SL-05, 11-SL-03, and 11S0001. The analyses indicated the highest level of potential risk appears to be in the vicinity of sampling location 11-SL-02. This location contained elevated concentrations of multiple COPCs including chlorinated pesticides, lead, and zinc.

E.4 RISK ASSESSMENT SUMMARY FOR SITE 12, TETRAETHYL LEAD DISPOSAL AREA

A HHRA was conducted for the chemical concentrations detected in six surface soil and 10 subsurface soil samples collected at Site 12.

Dieldrin was the only chemical selected as a COPC for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. No chemicals were selected as COPCs for subsurface soil. The non-cancer risk estimates (i.e., HIs) for dieldrin did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Cancer risk estimates for dieldrin did not exceed the State of Florida cancer risk benchmark of 1×10^{-6} or the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. None of the chemicals detected in the Site 12 surface or subsurface soils were identified as potential COCs based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

E.5 RISK ASSESSMENT SUMMARY FOR SITE 13, SANITARY LANDFILL

A HHRA was conducted for the chemical concentrations detected in 29 surface soil and three subsurface soil samples collected at Site 13.

No chemicals were selected as COPCs for the surface soil. Mercury was the only chemical selected as a COPC for subsurface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) for mercury did not exceed 1 for any of the receptors evaluated. Consequently, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Cancer risk estimates were not calculated because mercury is not a carcinogenic chemical.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. No chemicals were selected as potential COCs for surface soil. Mercury was selected as a potential COC for subsurface soils (residential land use scenario only; Level 1 SCTLs). However, the State of Florida residential SCTL (3.4 mg/kg) for mercury in soils conservatively assumes that elemental mercury, a volatile metal, is present in the soil. Risks associated with the inhalation route of exposure significantly impact the SCTL. In contrast, the USEPA Region 9 residential preliminary remediation goal (PRG) table presents a value for mercury and compounds (23 mg/kg) but does not specifically present a PRG for elemental mercury in soils (i.e., the preparers of the table did not automatically assume elemental mercury would be present in soils). Although it is plausible elemental mercury could be present in a sanitary landfill due to the disposal of thermometers, etc., it is unlikely that elemental mercury is the predominant form of mercury in the landfill. The maximum detected mercury concentration in subsurface soils (4.2 mg/kg) marginally exceeds the State of Florida SCTL for residential soils. As indicated in the preceding paragraph, adverse, non-carcinogenic health effects are not anticipated under the conditions established in the exposure assessment.

E.6 RISK ASSESSMENT SUMMARY FOR SITE 14, SHORT-TERM SANITARY LANDFILL

An HHRA was conducted for the chemical concentrations detected in six surface soil and two subsurface soil samples collected at Site 14.

No chemicals were selected as COPCs for surface or subsurface soil. Consequently, a quantitative HHRA (per USEPA guidelines) was not performed. Because no COPCs were identified, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment and cancer risks for the receptors of concern would not exceed the State of Florida cancer risk benchmark of 1×10^{-6} or the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. None of the chemicals detected in the Site 14 surface or subsurface soils were identified as potential COCs based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

E.7 RISK ASSESSMENT SUMMARY FOR SITE 15, SOUTHWEST LANDFILL

An HHRA was conducted for the chemical concentrations detected in 29 surface soil and five subsurface soil samples collected at Site 15.

No chemicals were selected as COPCs for surface soil. Aroclor-1242 and mercury were selected as COPCs for subsurface soil, and quantitative risk estimates were calculated for three future receptors (i.e., resident, typical industrial worker, and construction worker) per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) for the hypothetical future resident exposed to subsurface soil exceeded 1 for Aroclor-1242 indicating a potential for adverse, non-carcinogenic health effects under the conditions established in the exposure assessment. The non-cancer risk estimates (i.e., HIs) for the typical industrial worker or the construction worker did not exceed 1. The cancer risk estimate developed for the future resident hypothetically exposed to Aroclor-1242 in subsurface soils exceeded the State of Florida cancer risk benchmark of 1×10^{-6}. However, cancer risk estimates for the typical industrial worker and the construction worker did not, and none of the cancer risk estimates exceeded the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. Risk estimates for mercury did not exceed USEPA or State of Florida risk benchmarks.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. No chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs. Aroclor-1242 was selected as a potential COC for subsurface soils based on the comparison of the EPC to the relevant residential and industrial SCTLs. The maximum detected Aroclor-1242 concentration (2.2 mg/kg) marginally exceeds the current SCTL for the industrial land use scenario (2.1 mg/kg) and would not exceed the proposed SCTL for the industrial land use scenario (2.6 mg/kg). Aroclor-1242 was detected in only one of the five subsurface soil samples submitted for chemical analysis for the RI.

E.8 RISK ASSESSMENT SUMMARY FOR SITE 16, OPEN DISPOSAL AND BURNING AREA

An HHRA was conducted for the chemical concentrations detected in 27 surface soil and five subsurface soil samples collected at Site 16.

Four organics (cPAHs, Aroclor-1254, Aroclor-1260, and dieldrin) and six inorganics (antimony, barium, chromium, copper, lead, and mercury) were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. The cPAHs, barium, cadmium, chromium, copper, and lead were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) did not exceed 1 for any of the receptors evaluated for exposure to surface or subsurface soils. Consequently, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although the cancer risk estimate developed for the COPCs for surface soil for one of the five receptors evaluated (hypothetical future resident) exceeded the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the cPAHs; chemical-specific risk estimates for all other COPCs are less than 2×10^{-7}. The cancer risk estimate for a construction worker exposed to subsurface soils is 2×10^{-6} (primarily due to chromium); risk estimates for the resident and typical industrial worker exposed to subsurface soils are less than 1×10^{-6}. The risk evaluation of lead concentrations detected in the Site 16 soils indicates exposure to the average lead concentration in the soils would not result in blood lead concentrations exceeding USEPA benchmarks.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	None	None
Barium		
Copper		
Lead		

The quantitative risk assessment summarized in the preceding paragraph indicates cancer and non-cancer risk estimates for all other chemicals listed above do not exceed USEPA or State of Florida risk benchmarks (i.e., a cancer risk level of 1×10^{-6} or an HI of 1). The maximum concentrations of barium (257 mg/kg) and copper (202 mg/kg) exceed acute SCTLs. However, only the barium and copper results reported for location 16S007 exceed the acute SCTLs. The cPAH concentrations reported for this location also exceed non-apportioned SCTLs.

The following chemicals were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations to SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Barium	None	None
Copper		
Lead		

Maximum barium and copper concentrations in the subsurface soils exceed acute SCTLs. The maximum, but not the average, lead concentrations in the subsurface soils exceed the SCTL.

A screening level ecological risk assessment including Step 3A has been completed for surface soil at Whiting Field Site 16. Following an initial screening step where maximum site concentrations of contaminants were compared to conservative screening values, a list of COPCs was developed. COPCs consisted of PAHs, pesticides, PCBs, and metals. Bioaccumulative COPCs were analyzed in a food chain model to evaluate potential risks associated with consumption of contaminated food. The results of the food chain model indicated potential risks were primarily limited to lead. The list of COPCs was refined through an evaluation of spatial distribution, frequency of detection and detection limits, receptor home range, constituent bioavailability, and background. Additionally, COPC concentrations were compared to a variety of soil guidelines to reduce the uncertainty associated with using very conservative screening values, and to assist in characterizing spatial distribution of potential risk. The results of the refinement analyses indicated that based on spatial coverage and hazard quotients, lead and zinc contribute the most to site-related risk. The analyses further indicated that potential risk appears to be limited primarily to the vicinity of sampling locations 16S007 and 16S011. These locations contained elevated concentrations of multiple COPCs including lead and zinc.

E.9 RISK ASSESSMENT SUMMARY FOR SITE 17, CRASH CREW TRAINING AREA A

An HHRA was conducted for the chemical concentrations detected in 34 surface soil and 15 subsurface soil samples collected at Site 17. A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of the site in 1999 (Bechtel, March 2000). Consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying this permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction activities or an excavation bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Two organics (total xylenes, naphthalene), five inorganics (antimony, barium, cadmium, chromium, and copper), and TRPH were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. Antimony and chromium were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) developed for the resident, industrial worker, and construction worker exposed to TRPH in surface soils exceed 1 indicating a potential for non-carcinogenic health effects. However, the HIs developed for all other COPCs in surface or subsurface soil did not exceed 1. With the exception of the cancer risk estimates for the construction worker exposed to chromium in subsurface soils, none of the cancer risk estimates developed for the COPCs exceeded the State of Florida cancer risk benchmark of 1×10^{-6}; none of the risk estimates exceeded the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. As indicated below, chromium was not selected as a potential COC based on the comparison of maximum concentrations or EPCs to FDEP SCTLs for residential or industrial land use.

The risk assessment conducted using the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Barium	TRPH	None
Copper		
TRPH		

The maximum concentrations of barium (168 mg/kg) and copper (235 mg/kg) exceed acute SCTLs. However, these metals were detected in two or three locations only at concentrations exceeding the acute SCTLs. The EPC for TRPH (4,960 mg/kg) is an order of magnitude greater than the current residential SCTL (340 mg/kg).

No chemicals were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations or EPCs to SCTLs.

E.10 RISK ASSESSMENT SUMMARY FOR SITE 18, CRASH CREW TRAINING AREA B

An HHRA was conducted for the chemical concentrations detected in 47 surface soil and 24 subsurface soil samples collected at Site 18. A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of Site 18 in 1999 (Bechtel, 2000). Consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying this permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction activities or an excavation bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Three organics (cPAHs, 2-methylnaphthalene, and naphthalene), three inorganics (barium, cadmium, and copper), and TRPHs were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. 2-Methylnaphthalene, naphthalene, and TRPH were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) developed for the resident, industrial worker, and construction worker exposed to TRPH in surface soils and for the resident and construction worker exposed to TRPH in subsurface soils exceeded 1 indicating a potential for non-carcinogenic health effects. However, the HIs developed for all other COPCs in surface or subsurface soil did not exceed 1. Although the cancer risk estimate developed for the COPCs for surface soil for the hypothetical future resident and the typical industrial worker exceeded the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the carcinogenic PAHs; chemical-specific risk estimates for all other COPCs are less than 4×10^{-9}. cPAHs were only detected in 1 of 47 surface soil samples; the TRPH concentration reported for this sample was 18,000 mg/kg.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	cPAHs	cPAHs
TRPH	TRPH	
Barium		
Copper		

However, the predominant contaminant is TRPH. As noted above, cPAHs were detected in one surface soil sample only. The maximum concentration of copper (864 mg/kg) is greater than three times the SCTL, which is based on acute health effects (110 mg/kg). With one exception, the TRPH concentrations were also elevated in samples with copper concentrations exceeding this SCTL.

TRPH was the only contaminant selected as a potential COC for subsurface soils. The maximum detected concentration (7,190 mg/kg) and EPC (3,742 mg/kg) exceeded both residential and industrial SCTLs (340 mg/kg and 2,500 mg/kg, respectively).

TABLE ES-1

SUMMARY OF HUMAN HEALTH RISK ASSESSMENT RESULTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Site	Soil Dataset Evaluated	Cancer Risk Estimates >1x10-4	Cancer Risk Estimates >1 x 10-6	Hazard Index >1?	Direct Contact FDEP COCs?	Comments
9	Surface Soil	No	No	No	No	Site 9 is a two acre waste fuel disposal pit which is currently covered with 24 inches of soil and a native grass cover. The cap currently prevents direct contact exposure to underlying soils. The site is currently unused. The risk evaluation is limited by the fact that only five surface soil samples and no subsurface soils have been collected at Site 9.
10	Surface Soil	No	Resident (2E-05) Industrial worker (5E-05) Construction worker (2E-06) Recreational user (3E-06)	No	Level 1: cPAHs, Barium, TRPH Level 2 and Level 3: cPAHs	Site 10 is a four acre open disposal area adjacent to Site 9 which is currently covered with 24 inches fo soil and a native grass cover. The cap currently prevents direct contact exposure to underlying soils. The site is currently unused. The risk evaluation is limited by the fact that only three subsurface soil samples have been collected at Site 10.
	Subsurface Soil	No	Construction worker (1E-05)	No	None	
11	Surface Soil	No	Resident (3E-06)	No	Level 1: Dieldrin, Lead	Site 11 is a three acre area composed of an old borrow pit and an open disposal area. The site is unused at this time. The risk evaluation is limited by the fact that only three subsurface soil samples have been collected at Site 11. There is one lead "hot spot" location (11-SL-02; 2,230 mg/kg).
	Subsurface Soil	No	No	No	None	
12	Surface Soil	No	No	No	None	Site 12 is a 0.1 acre used for sludge disposal. The site is unused at this time and is heavily vegetated.
	Subsurface Soil	No	No	No	None	
13	Surface Soil	No	No	No	None	Site 13 is a four acre sanitary landfill which was closed and covered in 1984. The site is unused with exposed soil and sparse vegetation. The risk evaluation is limited by the fact that only three subsurface soils were collected at the site. The maximum detected mercury concentration in the subsurface soils marginally exceeds the State of Florida SCTL for residential soils.
	Subsurface Soil	No	No	No	Level 1: Mercury	
14	Surface Soil	No	No	No	None	Site 14 is a three acre sanitary landfill closed in 1979. The site is unused with some exposed soil. The risk evaluation is limited by the fact that only six surface soil and two subsurface soil samples were collected at the site.
	Subsurface Soil	No	No	No	None	
15	Surface Soil	No	No	No	None	Site 15 is a 21 acre operational landfill at which operations ceased in 1979. The site is currently unused with sparse vegetation. The risk evaluation is limited by the fact that only five subsurface soil samples have been collected at Site 15.
	Subsurface Soil	No	Resident (4E-06)	Resident (2)	Level 1: Aroclor 1242	
16	Surface Soil	No	Resident (5E-06)	No	Level 1: cPAHs, Barium, Copper, Lead	Site 16 is a 12 acre prior disposal area which was closed in 1965. The area is currently unused with good vegetative cover. The risk evaluation is limited by the fact that only five subsurface soil samples have been collected at the site.
	Subsurface Soil	No	Construction worker (2E-06)	No	Level 1: Barium, Copper, Lead	
17	Surface Soil	No	No	No except for TRPH.	Level 1: Barium, Copper, TRPH Level 2: TRPH	Site 17 is a four acre former air crash training/fire training area which is covered with 24 inches of soil and a native grass cover. The cap currently prevents direct contact exposure to underlying soils. HIs developed for the resident, industrial worker, and construction worker exposed to TRPH in surface soils underlying cap exceed 1.
	Subsurface Soil (<15 bgs)	No	Construction worker (2E-06)	No	None	
	Subsurface Soil (>15 bgs)	No	No	No	None	
18	Surface Soil	No	Resident (1E-05) Industrial worker (2E-06)	No except for TRPH.	Level 1: cPAHs, Barium, Copper, TRPH Level 2: cPAHs, TRPH Level 3: cPAHs	Site 18 is a five acre former fire training area which is covered with 24 inches of soil and a native grass cover. The cap currently prevents direct contact exposure to underlying soils. TRPH is the predominant contaminant. HIs developed for the resident, industrial worker, and construction worker exposed to TRPH in surface and subsurface soils underlying cap exceed 1.
	Subsurface Soil (<15 bgs)	No	No	No except for TRPH.	Level 1: TRPH	
	Subsurface Soil (>15 bgs)	No	No	No except for TRPH.	Level 1: TRPH	

CPAHs - Carcinogenic polycyclic aromatic hydrocarbons.
TRPH - Total recoverable petroleum hydrocarbons.
FDEP - Florida Department of Environmental Protection.
COC - Chemical of concern.
bgs - below ground surface.
< - less than.
> - greater than.
SCTL - Soil Clean-Up Target Level.

1.0 INTRODUCTION

This risk assessment report provides a re-evaluation of the risk assessments of soils presented in the remedial investigation (RI) reports previously prepared for Sites 9 through 18 at the Naval Air Station (NAS) Whiting Field, Milton, Florida. The original risk assessments were conducted by Harding Lawson Associates (HLA) in 1999 and 2000. The risk assessments and associated RIs are part of environmental investigations conducted by Naval Facilities Field Division South as part of the Department of Defense (DoD) Installation Restoration (IR) program. The IR program was designed to identify and abate or control contaminant migration resulting from past operations at naval installations.

1.1 OBJECTIVES AND SCOPE OF WORK

The risk assessments originally prepared in 1999 and 2000 were re-evaluated primarily because of changes in the risk assessment protocols and guidance recommended by the United States Navy and the United States Environmental Protection Agency (USEPA) since 2000, and because of proposed, significant changes in State of Florida Department of Environmental Protection (FDEP) regulations that potentially impact remedial decisions for the following sites:

- Site 9 – Waste Fuel Disposal Pit
- Site 10 – Southeast Open Disposal Area A
- Site 11 – Southeast Open Disposal Area B
- Site 12 – Tetraethyl Lead Disposal Area
- Site 13 – Sanitary Landfill
- Site 14 – Short-Term Sanitary Landfill
- Site 15 – Southwest Landfill
- Site 16 – Open Disposal and Burning Area
- Site 17 – Crash Crew Training Area A
- Site 18 – Crash Crew Training Area B

Recent Navy and USEPA policy and guidance documents for risk assessment and for the statistical analyses used to support both human and ecological risk assessments include but are not limited to the following:

- Navy Policy on the Use of Background Chemical Levels, Department of the Navy, (January 2004).

- Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, December 2002a).

- The Role of Background in the CERCLA Cleanup Program (USEPA, April 2002).

- Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (USEPA, September 2002).

Additionally, proposed FDEP regulations potentially impacting risk assessments and clean-up decisions at Site 9 through 18 are found in the draft rules for Chapters 62-777 and 62-780 of the Florida Administrative Code (FAC). The risk assessments presented in this document considered current risk assessment standards, criteria, and guidelines established or proposed by both the USEPA and FDEP. They also considered remedial actions conducted since the RIs published in 1999 and 2000 and the results of intensive background soil investigations/evaluations conducted for NAS Whiting Field in recent years.

The risk assessments included in this report provide a re-evaluation of the analytical data available for surface and subsurface soils only. The risk assessment of analytical data for groundwater will be provided separately in the Site 40 RI Report. A re-evaluation of risk estimates for surface waters and sediments was not required because minimal contamination was detected in the surface water samples reported in the original RI reports, sediment samples were not collected at any of the sites under investigation, and there are no permanent surface water bodies in the immediate vicinity of Sites 9 through 18.

Human health risk assessment (HHRA) re-evaluations are provided for soils at Sites 9 through 18. However, the ecological risk assessments (ERAs) presented in the original RI reports for Sites 11 and 16 only are updated. The ERAs for Sites 9, 10, 12, 13, 14, 15, 17, and 18 did not require a risk assessment re-evaluation either because no chemicals of potential concern for ecological receptors were identified in the original RIs or because an interim action eliminating an ecological risk assessment concern was conducted for the site.

1.2 REPORT ORGANIZATION

This risk assessment report is organized in 12 sections. Section 1 provides this brief introduction outlining the scope of work and the objectives of the risk assessment re-evaluations. Section 2 details the methodology used to perform the risk assessments. The site-specific risk assessments for Sites 9 through 18 are presented in Sections 3 through 12. All of the detailed statistical analyses conducted in support of the human and ecological risk assessments are presented in Appendix A. Supporting calculations and documentation for the human health and ecological risk assessments are found in Appendices B and C, respectively.

This risk assessment report is an update to the risk assessment information in the original RI reports published in 1999 and 2000. The detailed site investigation, geological, hydrogeological, nature and extent, and fate and transport information presented in the original RI reports is not repeated in this report. The reader is referred to the original RI reports for figures depicting site-specific features and surface and subsurface soil sample locations.

2.0 RISK ASSESSMENT METHODOLOGY

This section presents the human health risk assessment (HHRA) methodology and the screening level ecological risk assessment (SLERA) methodology used to evaluate chemical concentrations in surface and subsurface soil at Sites 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18 at NAS Whiting Field. These sites were previously evaluated in 1999 and 2000 using the methodology described in the Remedial Investigation and Feasibility Study General Information Report (GIR) (ABB-ES, January 1998). The risk assessments for these sites are being re-evaluated and updated to assure they are in compliance with current USEPA, State of Florida, and Navy guidance/methods and to update any risk assessment results with potential impact on risk management decisions for these sites. The objective of the risk assessments is to determine whether detected concentrations of chemicals in surface and subsurface soil at these sites pose significant threats to potential human or ecological receptors under current and/or future land use. The potential risks to receptors are estimated based on the assumption no further actions are taken to control contaminant releases or prevent receptor exposure. Details relevant to the individual sites are presented and discussed in the site-specific risk assessment reports (Sections 3.0 through 12.0).

2.1 HUMAN HEALTH RISK ASSESSMENT PROTOCOL

The following USEPA, State of Florida DEP, and Navy guidance documents and regulations were used to develop the HHRA methodology and to evaluate potential risks for each site:

- Conducting Human Health Risk Assessments under the Environmental Restoration Program, Department of the Navy, February 2001.

- Navy Policy on the Use of Chemical Background Levels, Department of the Navy, January 2004.

- Technical Report: Development of Soil Cleanup Target Levels for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999. (A draft update to this report and associated proposed regulations presented in State of Florida DEP Rule 62-780, dated February 2004, were also considered in this risk assessment report.)

- Draft Guidance for Comparing Site Contaminant Concentration Data with Soil Cleanup Target Levels, Florida Department of Environmental Protection (FDEP), February 2004.

- Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A), USEPA, December 1989.

- Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, USEPA, March 1991.

- Guidance for Data Usability in Risk Assessment (Part A), USEPA, April 1992.

- Supplemental Guidance to RAGS: Calculating the Concentration Term, USEPA, May 1992.

- Preliminary Review Draft: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure, USEPA, May 1993.

- Soil Screening Guidance: Technical Background Document, USEPA, July 1996.

- Exposure Factors Handbook, USEPA, August 1997.

- Supplemental Guidance to RAGS: Region IV Bulletins, Human Health Risk Assessment, USEPA Region 4, May 2000.

- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance, Dermal Risk Assessment) Interim Guidance, USEPA, September 2001.

- Role of Background in the CERCLA Cleanup Program, USEPA, April 2002.

- Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA, December 2002b.

- Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, USEPA, December 2002a.

The components of a HHRA are addressed in the following sections:

- Data Evaluation Protocol [including data usability assessment; chemical of potential concern (COPC)] selection)
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization
- Uncertainty Analysis

The risk assessment presented in this report considers both USEPA and FDEP policies and guidelines available for conducting human health risk assessments. Quantitative risk estimates are developed for receptor exposure to surface and subsurface soil using the “risk-ratio” approach defined in Section 2.1.2.3. USEPA Region IV supports the use of this technique. Additionally, most of the site-soil-concentration to FDEP Soil Clean-up Target Level (SCTL) comparisons recommended in FDEP Proposed Rule 62-780 are provided. This proposed rule presents a phased (i.e., Level 1, Level 2, Level 3) risk-based corrective action process (RBCAP) that is iterative and tailors site rehabilitation tasks to site-specific conditions and risks.

2.1.1 Data Evaluation Protocol

Data evaluation, the first component of a baseline HHRA, is a two-step, medium-specific task involving the compilation and evaluation of analytical data. The first step involves the compilation of the analytical database and an evaluation of data usability for purposes of HHRA. The second step of the data evaluation is the selection of a medium-specific list of COPCs which are used to quantitatively or qualitatively determine potential human health risks for site media. COPCs are selected primarily based on a toxicity screen (i.e., a comparison of site contaminant concentrations to conservative toxicity screening values) and a background screen (i.e., a comparison of site concentrations to background concentrations). In addition, as discussed below, factors such as frequency of detection are considered in some cases. The results of the COPC selection are documented in the site-specific COPC selection tables (Sections 3.0 through 12.0).

2.1.1.1 Data Usability

Data collected from the field investigations conducted from 1992 to 1996 and reported in the RI reports prepared by ABB Environmental Services, Inc. (ABB-ES) in 1999 and 2000 were used to re-assess risks to potential human receptors. Additional data collected at some sites post the RIs (e.g., samples collected for lead analysis at Site 11) were also included in the revised risk assessment evaluations. Analytical data for each site is presented and described in the site-specific risk assessments (Sections 3.0 through 12.0 of this report). The data were validated according to USEPA data validation guidelines as described in the GIR (ABB-ES, January 1998). Data quality issues affecting risk assessments were discussed in detail in the original site-specific risk assessments presented in the RI reports published in 1999 and 2000.

Fixed-based analytical results only from the field investigations were used in the quantitative risk evaluation. All detected concentrations with "J" qualifiers are considered positive detections and were used in the risk evaluation. Data with "U" and "UJ" qualifiers and data qualified because of blank contamination were retained and evaluated as nondetects. Field measurements and data regarded as unreliable (i.e., qualified as "R" during the data validation process) were not used in the quantitative risk assessment.

2.1.1.2 Selection of Chemicals of Potential Concern for Quantitative Risk Assessment

The selection of COPCs is a qualitative screening process used to limit the number of chemicals and exposure routes quantitatively evaluated in the baseline HHRA to those site-related constituents that dominate overall potential risks. Screening, primarily by risk-based concentrations and basewide background levels, is used to focus the risk assessment on meaningful chemicals and exposure routes.

In most cases, a chemical is selected as a COPC and retained for further quantitative risk evaluation if the maximum detection in a sampled medium exceeds the selected risk-based concentration(s) (i.e., the COPC screening level) and the chemical is determined to be present at concentrations exceeding background. This second condition applies only to those chemicals for which background comparison is possible and appropriate (e.g., metals). (Background data are not available for organic chemicals). Chemicals eliminated from further evaluation at this time are assumed to present minimal risks to potential human receptors. Medium-specific tables summarizing the selection of COPCs are included in the site-specific risk assessments (Sections 3.0 through 12.0 of this report).

2.1.1.2.1 <u>COPC Screening Levels</u>

Several types of screening concentrations were used to identify COPCs for soils at Sites 9 through 18. The screening concentrations were based on the following USEPA and State of Florida criteria:

- USEPA Region 9 Preliminary Remediation Goals (PRGs) for Residential Soil (USEPA Region 9, October 2002)

- Florida Soil Target Cleanup Levels (STCLs) for Direct Contact (FDEP, August 1999) (Proposed values, dated February 2004, are also included on the COPC selection tables as a point of reference. According to the DEP, the proposed values may not be finalized until November 2004 or later.)

Most of the Region 9 PRGs and State of Florida STCLs are based on a Hazard Quotient (HQ) of 1.0 (i.e., a no adverse non-carcinogenic effect level) or a cancer risk level of $1X10^{-6}$ (i.e., a one-in-one million probability of developing cancer) but are adjusted (lowered) to reflect cumulative risk issues (e.g., Region 9 PRGs are typically adjusted to reflect a HQ of 0.1). The screening levels for both carcinogens and non-carcinogens were developed in keeping with the simple apportionment approach presented in Rule Development Workshop for Chapters 62-770, -777, -780, and -785, F.A.C, Additive Effects and

Apportionment (FDEP, online at http://fdep.ifas.ufl.edu/). For example, if there are 10 carcinogens present in an environmental media, the carcinogenic screening levels are based on 1×10^{-7} cancer risk level so the total cancer risk from exposure to contaminants in a medium at a site does not exceed 1×10^{-6}. The adjusted values are used as COPC screening levels.

Because of the different exposure scenarios for potential human receptors, COPCs are identified separately for surface and subsurface soil. Surface soil is defined as soil collected from 0 to 2 feet below ground surface (bgs) and subsurface soil is defined as soil collected from depths of 2 to 15 feet bgs (ABB-ES, January 1998). A few soil samples were collected at depths greater than 15 feet bgs at some sites. While human receptors are not likely to directly contact soils deeper than 15 feet bgs, these samples were evaluated in the site specific risk assessments for purposes of completeness. Quantitative risk estimates are presented for COPCs detected in these soils in the uncertainty section of the site-specific risk assessments (Section 3.0 through 12.0).

Exposure to COPCs in subsurface soil is typically evaluated only for potential exposure during construction or excavation activities. Therefore, a construction/excavation worker is considered to be the receptor most likely exposed to COPCs in subsurface soil. However, subsurface soil could potentially be brought to the surface during future excavation projects resulting in exposure of other receptors such as future residents or workers. For this reason, potential exposure of residents and typical industrial workers to subsurface soils are also evaluated in the site-specific risk assessments.

Screening Levels for Lead

Limited criteria are available to evaluate the potential risks associated with lead. There are no strictly risk-based concentrations for this chemical because the USEPA has not derived toxicity values [i.e., cancer slope factors (CSFs), reference doses (RfDs)] for lead. However, recommended screening levels are available for lead in soil and are frequently used to indicate the need for response activities.

Guidance from both the Office of Prevention, Pesticides, and Toxic Substances (OPPTS) and the Office of Solid Waste and Emergency Response (OSWER) recommend 400 mg/kg as the lowest screening level for lead-contaminated soil in a residential setting where children are frequently present (USEPA, July 1994). OPPTS identifies 2,000 to 5,000 mg/kg as an appropriate range for areas where contact with soil by children in a residential setting is less frequent. A value of 400 mg/kg is used as the screening level for COPC selection for both surface and subsurface soil.

Guidance for the USEPA Technical Review Workgroup (TRW) for Lead indicates that “a reasonable screening level for soil lead at commercial/industrial (i.e., non-residential) sites is 800 mg/kg” for a typical non-contact intensive worker (USEPA, April 2004). This value is not used for COPC selection but may be used in the qualitative evaluation of lead. The current State of Florida commercial/industrial SCTL for lead in soil is 920 mg/kg (FDEP, August 1999).

Essential Nutrients and Chemicals without Toxicity Criteria

The essential nutrients calcium, magnesium, potassium, and sodium are not included in the COPC screening process. These inorganic chemicals are naturally abundant in environmental matrices and are only toxic at high doses and, because of the lack of toxicity criteria, risk-based COPC screening levels are not available for these chemicals in the Region 9 PRG table or FDEP SCTL tables.

Risk-based screening levels are currently not available for several constituents detected at the NAS Whiting Field sites [e.g., acenaphthylene, benzo(g,h,i)perylene, 2-methylnaphthalene, phenanthrene, delta-BHC, endosulfans, chlordanes, and endrin ketone]. Therefore, screening levels available for surrogate chemicals are used as screening levels for these constituents, as recommended, for example, by USEPA Region 1 (USEPA, August 1999). For example, in the COPC selection for NAS Whiting Field sites, the screening level for acenaphthene is used as a surrogate for acenaphthylene, pyrene for benzo(g,h,i)perylene and phenanthrene, naphthalene for 2-methylnaphthalene, alpha-BHC for delta-BHC, endrin for endrin aldehyde and endrin ketone, chlordane for chlordane compounds, and endosulfan for endosulfan compounds. Surrogate compounds are identified on each applicable site-specific COPC selection table.

2.1.1.2.2 Background Screen

Background concentrations are those that would exist in the absence of influence from site operations. For soils, background concentrations are the concentrations found in soils not influenced by site operations. The development of soil background datasets for NAS Whiting Field is discussed in Appendix A. If the detected site concentrations of an analyte are less than background levels, the analyte is not selected as a COPC.

The elimination of chemicals as site-related COPCs on the basis of background comparisons follows Navy Policy on the Use of Background Chemical Levels (Department of the Navy, January 2004). This document also presents the Navy's interpretation of the USEPA guidance provided in the document titled Role of Background in the CERCLA Cleanup Program (USEPA, April 2002) and details the methodology to be used in evaluating background under the Navy's Environmental Restoration and Base Realignment and Closure (BRAC) programs. Navy policy applies to both the screening-level and baseline risk assessments and requires the following:

1. A clear and concise understanding of chemicals released from a site thus ensuring the Navy is focusing on remediating the release.

2. The use of background data in the screening-level risk assessment.

   a. The comparison of site chemical levels to risk-based screening criteria.
   b. The comparison of site chemical levels to background concentrations.
   c. The identification of site-related COPCs based on screening criteria comparisons AND background comparisons. Site-related COPCs are those chemicals with concentrations exceeding risk-based screening criteria AND background concentrations. To the extent possible, site-related COPCs are further evaluated quantitatively in the baseline risk assessment. (Non-site-related COPCs are further discussed in the risk characterization sections of the baseline risk assessments.)

3. The consideration of background in the baseline risk assessment.

   a. The calculation of risk estimates for site-related COPCs only.
   b. The further evaluation of non-site-related COPCs in the risk characterization section only (e.g., the evaluation of chemicals detected at concentrations exceeding screening criteria but less than background concentrations). Non-site-related COPCs are compared to risk-based screening benchmarks and discussed in the risk characterization sections. The Navy considers this comparison to be consistent with USEPA's Role of Background in the CERCLA Cleanup Program (USEPA, April 2002).

4. The selection of site cleanup remedial goals at levels not less than background levels. Additionally, cleanup levels should not be developed for chemicals not identified as chemicals of concern (COCs). As defined in the Navy guidance, COCs are site-related COPCs found to be the risk drivers in the baseline risk assessment and that may pose unacceptable human or ecological risks.

The statistical analysis protocols for the comparisons of site and background soils data are presented in Appendix A. The recommended statistical analysis follows guidance provided in the USEPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (USEPA, September 2002). As indicated in this guidance document, the background comparisons involve statistical dataset-to-dataset comparisons rather than simple site concentration-to-background benchmark comparisons such as comparing maximum site concentrations to maximum background concentrations. According to the guidance, simple number-to-number comparisons "can be used with very small data sets but are highly uncertain."

The background data for surface and subsurface soil are presented in Appendix A. The results of the background screens are presented in the COPC selection tables of each site-specific risk assessment (Sections 3.0 through 12.0). Supporting documentation for the background screens is also presented in Appendix A.

2.1.1.2.3 Frequency Screen

If an analyte is detected in less than 5 percent of the samples, it may not be selected as a COPC (ABB-ES, January 1998). A frequency screen is conducted only when there are 20 or more samples of the medium of concern. The decision to eliminate a chemical because of low detection frequency is also based on site history (i.e., is there a reason to believe a chemical may or may not be related to past site activities) and the magnitude of the concentration (i.e., does the concentration of a chemical indicate a potential hotspot area).

2.1.1.2.4 Decision Rules for Establishing Chemicals of Potential Concern

The applicable decision rules for the selection of COPCs are as follows:

- A chemical detected in soil is selected as a COPC for soil if the maximum concentration exceeds the screening level for soil and if the background screen indicates the site concentrations are statistically greater than the corresponding background concentrations.

- Individual chemicals are eliminated as COPCs if they are detected at a frequency of less than 5 percent in any given medium but only if there are no other indications the chemical would pose an unacceptable risk to receptors (e.g., there is no evidence of a contaminant “hot spot”). Chemicals exhibiting unusually high concentrations or are clearly site-related may be retained as COPCs at the discretion of the human health risk assessor.

- If a chemical is not detected in any of the samples in a particular medium, and the detection limits exceeds the risk-based screening levels, the chemical is not selected as a COPC but is qualitatively discussed in the uncertainty analysis section.

- The essential nutrients (calcium, magnesium, potassium, and sodium) are not identified as COPCs.

- Chemicals with concentrations exceeding toxicity screening concentrations but are determined to be less than background concentrations based on the background screen are not selected as COPCs but are further evaluated (qualitatively or quantitatively) in the risk characterization and uncertainty sections of the site-specific risk assessments. This evaluation is included in the HHRA as suggested by the following USEPA guidance documents: The Role of Background in the CERCLA Cleanup Program (April 2002) and Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (September 2002).

2.1.2 Exposure Assessment/Estimation of Risk

The exposure assessment defines and evaluates, quantitatively or qualitatively, the type and magnitude of human exposure to the chemicals present at or migrating from a site. The exposure assessment is designed to depict the physical setting of the site, to identify potentially exposed populations and applicable exposure pathways, to determine concentrations of COPCs to which receptors might be exposed, and to estimate chemical intakes under the identified exposure scenarios. Actual or potential exposures at a site are determined based on the most likely pathways of contaminant release and transport, as well as human activity patterns. A complete exposure pathway has three components: (1) a source of chemicals that can be released to the environment, (2) a route of contaminant transport through an environmental medium, and (3) an exposure or contact point for a human receptor. These components can be integrated and described by means of a conceptual site model (CSM), which is an essential element of the exposure assessment.

Current or potential human exposures identified by the CSM are evaluated using the “risk-ratio” approach defined in Section 2.1.2.3. As noted above, this approach is supported by USEPA Region 4. The approach uses exposure point concentrations (EPCs) for the COPCs in soil and relevant risk-based concentrations to generate cancer and non-cancer risk estimates for receptors of concern. The risk-based concentrations used to estimate risk are the FDEP SCTLs developed for the residential and industrial land use scenarios and risk-based concentrations developed for other receptors using USEPA and FDEP guidance documents. The risk-based concentrations define and incorporate all the exposure factors (e.g., soil ingestion rates) used to determine chemical intake/exposure by receptors of concern.

2.1.2.1 Conceptual Site Model

The foundation of an exposure assessment is the CSM, which identifies site characteristics including potential contaminant sources, contaminant release mechanisms, transport routes, receptors under current and future land use scenarios, and other appropriate information. The CSM integrates information regarding the physical characteristics of the site, exposed populations, sources of contamination, and contaminant mobility (fate and transport) to identify potential exposure routes and receptors to be evaluated in the risk assessment. A well-defined CSM allows for a better understanding of the risks at a site and aids risk managers in the identification of the potential need for remediation. A general overview of CSM information relevant to Sites 9 through 12 is provided below; more site-specific information is presented in Sections 3.0 through 12.0. Table 2-1 provides a general summary of the potential receptors and exposure routes evaluated in the site-specific risk assessments.

As note above, the CSM depicts the relationships among the following elements:

- Site sources of contamination
- Contaminant release mechanisms
- Transport/migration pathways
- Exposure routes
- Potential receptors

A general discussion of these elements is provided in following paragraphs.

Sources of Environmental Contamination

The sources, contaminated media, and types of contamination for each site are presented and discussed in the site-specific HHRAs. In overview, most of the sites evaluated in this risk assessment are disposal or landfill areas. However, two of the sites were crash crew training areas (Sites 17 and 18). Most of the sites under investigation are 2 to 5 acres in size. However, Site 12 is only 0.1 acre and Sites 15 and 16 are 21 and 12 acres, respectively. With the exception of Sites 17 and 18, volatile organic chemicals are not significant site contaminants. Semivolatile organics (e.g., total petroleum hydrocarbons) and metals (e.g., lead, cadmium) are the predominant COPCs at most of the sites. Surface and subsurface soils are the primary media impacted by environmental contamination and are the only media evaluated in this risk assessment.

Potential Contaminant Migration Routes

Assuming surface and subsurface soil contamination has occurred as a result of chemical usage/waste disposal and chemicals may migrate to deeper subsurface soils and groundwater, the primary plausible contaminant release and migration mechanisms at NAS Whiting Field Sites 9 through 18 are as follows:

- Migration of soil contaminants downward through the soil column with infiltrating precipitation. Chemicals may continue to migrate in groundwater via dispersion and advection in the downgradient direction. Depth to groundwater at Sites 9 through 14 is approximately 50 to 55 feet bgs. Depths to groundwater at Sites 17 and 18 are 85 and 70 feet bgs, respectively. The depth to groundwater at Sites 15 and 16 ranges from 10 to 40 feet bgs. An evaluation of groundwater and the potential for leaching from soils to groundwater will be presented in the Site 40 RI report. However, based on the groundwater analytical data presented in the 1999 and 2000 RI reports, the importance of chemical migration from soils to groundwater appears to be somewhat limited.

- Migration of fugitive dusts and volatile organic compounds (VOCs) from surface soils (and subsurface soils if construction/excavation activities occur) into ambient air. Currently, Sites 9 through 12 are unused areas overgrown with vegetation. Additionally, an engineered soil cover was added to Sites 9, 10, 17, and 18 in 1999. Consequently, the potential for migration of airborne fugitive dusts and VOCs from the surface soils at Sites 9 through 18 is not significant.

The potential for migration of contaminants in soil at each site is further discussed in the site-specific risk assessments. Because no surface water bodies (other than intermittent streams) are present in the immediate vicinity of NAS Whiting Field Sites 9 through 18, the potential for runoff from surface soil to a surface water body is not addressed. The potential for migration of chemicals from soils to groundwater to surface water downgradient of Sites 15 and 16 (i.e., Clear Creek) is discussed in the site-specific risk assessments.

Potential Current and Future Receptors of Concern and Exposure Pathways

NAS Whiting Field is an active facility and will remain active for the foreseeable future. However, for purposes of completeness, the baseline risk assessments prepared for Sites 9 through 18 consider receptor exposure under residential, industrial, and recreational land use scenarios. Based on current and potential future land use, the following potential receptors may be exposed to contaminated environmental media at Sites 9 through 18:

- **Site Maintenance Worker** – An on-site receptor under current/future land use. This includes adult military or civilian personnel assigned to work (primarily groundskeeping/outdoor maintenance activities) at a site. This receptor could be exposed to surface soil by incidental ingestion, dermal contact, and inhalation (i.e., airborne particulates/vapors) during groundskeeping or maintenance activities. This receptor would not be expected to be routinely exposed to subsurface soils. This receptor is expected to be exposed to surface soil for 30 days per year based on professional judgment (ABB-ES, 1998). The maintenance worker may be the only potential current receptor for Sites 9 through 18 because the sites are currently unused and overgrown with vegetation.

- **Construction/Excavation Worker** – A plausible on-site receptor under future land use. However, no major construction activities are currently planned at the above-mentioned sites. This receptor could be exposed to surface and subsurface soils by incidental ingestion, dermal contact, and inhalation (i.e., airborne particulates/vapors). The construction worker is assumed to be exposed to soil for 250 days per year (USEPA, December 2002b) for the Reasonable Maximum Exposure (RME) scenario and 219 days per year for the Central Tendency Exposure (CTE) scenario (USEPA, May 1993).

- **Typical Occupational Worker** – An on-site receptor under future land use. Future occupational workers may work at the site if the facility were to close and be developed for commercial/industrial uses. To provide information for risk management decisions, potential risks to future occupational workers are quantified in the risk assessments. This receptor could be exposed to surface soil by incidental ingestion, dermal contact, and inhalation (i.e., airborne particulates/vapors). This receptor would not be expected to be routinely exposed to subsurface soils. The occupational worker is expected to be exposed to surface soils for 250 days per year (USEPA, May 1993 and December 2002) for the RME and 219 days per year for the CTE but less intensely than the maintenance or construction worker. If VOCs are significant organic contaminants in soil at a site, this receptor is also evaluated for potential exposure to VOCs impacting indoor air quality.

- **Adult and Adolescent Recreational User/Trespasser** – A plausible receptor under current and future land use. Although access to the base is controlled, once inside the base, access to Sites 9 through 18 is not limited by any physical constraints. This receptor may be exposed to potentially contaminated surface soil by incidental ingestion, dermal contact, and inhalation (i.e., airborne particulates/vapors). Recreational users/trespassers are assumed to be exposed to COPCs in soil for 45 days per year, based on professional judgment. Direct contact with subsurface soils is not anticipated for this receptor.

- **On-Site Child and Adult Resident** – A few residences currently exist just beyond the west perimeter gate of NAS Whiting Field. No other residences are closer than approximately 1000 feet from the facility boundary. A future residential scenario was evaluated in the risk assessments for decision-making purposes although this scenario is unlikely for the NAS Whiting Field sites. For example, the need for deed restrictions at a site may be eliminated prior to site closure if minimal risks are estimated for residential receptors. It is assumed a resident may be exposed to surface soils by incidental ingestion, dermal contract, and inhalation (i.e., airborne particulates/vapors). If VOCs are significant organic contaminants in surface soils at a site, this receptor is also evaluated for potential exposure to VOCs impacting indoor air quality. Routine direct contact with subsurface soils is not anticipated for this receptor. Residential receptors are assumed to be exposed to surface soils 350 days per year (USEPA, May 1993).

All of these receptors are used to characterize risk at Sites 9 through 18. Although most are hypothetical only, Sites 9 through 18 are located just inside the NAS Whiting Field facility. Consequently, trespassers are more plausible receptors for these boundary sites than sites at located at the interior of the facility.

2.1.2.2 Calculation of Exposure Point Concentrations

The EPC, calculated for COPCs only, is a reasonable estimate of the chemical concentration likely to be contacted over time by a receptor and is used to calculate estimated exposure intakes.

The 95-percent upper confidence limit (UCL), which is based on the distribution of a dataset, is considered to be the best estimate of the exposure concentration for datasets with 10 or more samples (USEPA, May 1992). The 95-percent UCL is used as the EPC to assess risks for RME and CTE scenarios (USEPA, May 1993). For datasets with less than 10 samples, the UCL is considered to be a poor estimate of the mean, and the EPC is defined as the maximum concentration. Calculation of EPCs followed the protocol described in Appendix A, which was prepared in accordance with the USEPA's Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (December 2002a).

The following decision rules were used to calculate EPCs:

- If a soil dataset contains fewer than 10 samples, the EPC for the RME and CTE cases is defined as the maximum detected concentration.

- If a soil dataset contains 10 or more samples, the 95-percent UCL on the arithmetic mean, which is based on the distribution of the dataset, was selected as the EPC for the RME and CTE scenarios. UCLs were calculated according to USEPA guidelines described in Appendix A.

- If the calculated 95-percent UCL exceeded the maximum detected concentration, the maximum concentration was used as the EPC.

- Sample and duplicate analytical results were averaged before the EPC was calculated.

- A data value less than the sample-specific detection limit was substituted with one-half the detection limit.

The datasets for surface or subsurface soil include all sampled locations within the site study areas unless:

- The analytical data for soils suggest the presence of a significant contaminant hot spot within the study area

- The hot spot is large enough to be considered an exposure unit for one or more of the receptors being evaluated. For example, a residential lot size of ¼ acre to 2 acres is often used for the evaluation of a hypothetical future resident.

2.1.2.3 Chemical Intake and Risk Estimation

Cancer and non-cancer risk estimates for COPCs detected in soil are determined using the following simple "risk ratio" technique, which involves the selection (or development) of risk-based concentrations established at the 1×10^{-6} cancer risk level or HQ of 1 and the calculation of cancer and non-cancer risks based on the EPC and the risk based concentration:

$$\frac{\text{Risk - based Concentration}}{\text{EPC for COPC}} = \frac{\text{HQ of 1 or Cancer Risk Estimate of 1E - 06}}{\text{HQ or Cancer Risk Estimate for COPC}}$$

This is a valid technique for estimating risk because all of the intake and risk characterization equations used to develop risk-based concentrations are linear. The risk-based concentrations used in the HHRAs for the evaluation of the hypothetical future resident and the typical occupational worker are the State of Florida SCTLs or risk-based concentrations based on the methodology for the development of residential and industrial SCTLs presented in the draft Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC dated February 26, 2004.

Cancer and non-cancer risk estimates for all other receptors evaluated in the site-specific HHRAs (i.e., the construction worker, the maintenance worker, and the recreational user/trespasser) are based on risk-based concentrations developed using the exposure dose assumptions and the simple intake equations presented in the following paragraphs and the toxicity criteria (slope factors and reference doses) discussed in Section 3.0. The simple intake equations are combined to produce one risk-based concentration per chemical that accounts for ingestion, dermal, and inhalation exposures. (The risk-based concentration calculations are presented in Appendix B.) The risk-based concentrations are established by setting the cancer and non-cancer risk levels at 1×10^{-6} or hazard index of 1, respectively, and solving for the associated contaminant concentration in soil as demonstrated in the USEPA Risk Assessment Guidance for Superfund, Part B (December 1991). The exposure assumptions selected for the construction worker, the maintenance worker, the recreational user/trespasser were based on current USEPA risk assessment guidance (December 1989 and September 2001) and State of Florida guidance (see Tables 2-2 through 2-9). Risk assessment spreadsheets for the calculation of the risk estimates are presented in Appendix B. As discussed below, risk estimates are typically calculated for the RME scenario and may also be calculated for the CTE scenario at the risk assessor's discretion.

Traditionally, exposures evaluated in HHRAs were based on the concept of a RME scenario only, which is defined as "the maximum exposure that is reasonably expected to occur at a site" (USEPA, December 1989). However, more recent risk assessment guidance (USEPA, February 1992) indicates the need to address an average case or CTE. To provide a full characterization of potential exposure, an evaluation of the CTE scenario may be included in the site-specific risk assessments. The available guidance (USEPA, May 1993) for the CTE evaluation is limited and at times vague. Therefore, professional judgment may be exercised when defining CTE conditions for a particular receptor at a site.

2.1.2.3.1 Incidental Ingestion of Soil

Incidental ingestion of soil by potential receptors coincides with dermal exposure. Exposures associated with incidental ingestion were estimated in the following manner (USEPA, December 1989):

$$\text{Intake}_{si} = (C_{si})(IR_s)(FI)(EF)(ED)(CF)/(BW)(AT)$$

where:

Intake_{si}	=	intake of contaminant "i" from soil (mg/kg/day)
C_{si}	=	concentration of contaminant "i" in soil (mg/kg)
IR_s	=	ingestion rate (mg/day)
FI	=	fraction ingested from contaminated source (dimensionless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (year)
CF	=	conversion factor (1×10^{-6} kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days); for noncarcinogens, AT = ED x 365 days/year; for carcinogens, AT = 70 years x 365 days/year

As noted above, the State of Florida SCTLs are used calculate cancer and non-cancer risk estimates for the hypothetical future resident and a typical industrial worker. Exposure assumptions for the other receptors are described below and were used to develop risk-based concentrations for the construction worker, the maintenance worker, and the recreational user/trespasser (Appendix B).

A default value of 1.0 (USEPA, December 1989) is recommended for the fraction of soil ingested from the contaminated source for the RME and CTE scenarios. The ingestion rates for the RME were set at 330 mg per day for the construction worker (USEPA, December 2002b), 50 mg per day for the maintenance workers (FDEP, August 1999), and 100 mg per day for adult and adolescent trespassers/recreational users (USEPA, May 1993). Ingestion rates for the CTE were set at 330 mg per day for the construction worker (USEPA, December 2002b) and 50 mg per day for the maintenance worker and recreational user/trespasser. The exposure frequencies used to estimate intakes for incidental ingestion of soil are presented in Section 2.1.2.1.

2.1.2.3.2 Dermal Contact with Soil

Direct physical contact with soil may result in the dermal absorption of chemicals. Exposures associated with the dermal route were estimated in the following manner (USEPA, December 1989 and September 2001):

$$\text{Intake}_{si} = (C_{si})(SA)(AF)(ABS)(CF)EF)(ED)/(BW)(AT)$$

where: Intake_{si} = amount of chemical "i" absorbed during contact with soil (mg/kg/day)

C_{si} = concentration of chemical "i" in soil (mg/kg)

SA = skin surface area available for contact (cm^2/day)

AF = skin adherence factor (mg/cm^2)

ABS = absorption factor (dimensionless)

CF = conversion factor (1×10^{-6} kg/mg)

EF = exposure frequency (days/year)

ED = exposure duration (year)

BW = body weight (kg)

AT = averaging time (days);
for noncarcinogens, AT = ED x 365 days/year;
for carcinogens, AT = 70 years x 365 days/year

As noted above, the State of Florida SCTLs were used to calculate cancer and non-cancer risk estimates for the hypothetical future resident and a typical industrial worker. Exposure assumptions for the other receptors are described below and were used to develop risk-based concentrations for the construction worker, the maintenance worker, and the recreational user/trespasser.

The exposed surface areas of the body available for dermal contact are determined on a receptor-specific basis and are based on assumed human activities and clothing worn during exposure events. Current guidance (USEPA, August 1997 and September 2001) was used to develop the assumptions concerning the amount of skin surface area available for contact for a receptor. To maintain consistency from project to project, input parameters recommended in the previous risk assessments at NAS Whiting Field and presented in the GIR (ABB-ES, January 1998) were also reviewed when determining the exposed surface areas. The rationales used to select the skin areas are as follows:

- The head, hands, and forearms of excavation/construction worker and maintenance workers were assumed to be exposed to soils (assuming the receptors wear a short-sleeved shirt, long pants, and shoes). As recommended in the Risk Assessment Guidance for Superfund (RAGS) Part E (USEPA, September 2001), the skin surface area for a worker was assumed to be 3,300 cm^2 for the RME and CTE scenarios. This value represents the average of the 50^{th}-percentile areas of males and females more than 18 years old.

- For the adolescent trespassers/recreational user, 25 percent of the total body surface area for an adolescent (aged 7 to 16) was assumed to be available for surface soil contact. The RME value (3,280 cm^2) was derived from the 95^{th}-percentile surface area data, and the CTE value (3,100 cm^2) was derived from the 50^{th}-percentile of the data.

- For the adult trespasser/recreational user assumed to be exposed to surface soil, the exposed skin surface area available for contact was the value recommended for the adult resident in Exhibit 3-5 of RAGS Part E (USEPA, September 2001), 5,700 cm^2 for both the RME and for the CTE. This surface area assumes the head, hands, forearms, and lower legs of the receptor are available for contact.

Values of soil adherence factors and chemical-specific dermal absorption factors provided in RAGS Part E (USEPA, September 2001) were used to evaluate risks from exposure to soil. The following soil adherence factors are recommended for the RME and CTE exposure scenarios:

- Maintenance Worker - 0.2 mg/cm^2 for the RME and 0.02 mg/cm^2 for the CTE (Exhibit 3.5; USEPA, September 2001).

- Construction workers - 0.3 mg/cm^2 for the RME and 0.1 mg/cm^2 for the CTE. These values are the 95^{th}-percentile and geometric mean values for construction workers, respectively (Exhibit 3.3; USEPA, September 2001).

- Adolescent Trespassers/Recreational Users - 0.3 mg/cm^2 for the RME and 0.04 mg/cm^2 for the CTE. These values are the 95^{th}-percentile and geometric mean values presented for soccer players (teens) playing in moist conditions (Exhibit 3.3; USEPA, September 2001).

- Future adult trespassers/recreational users - 0.07 mg/cm^2 for the RME and 0.01 mg/cm^2 for the CTE (Exhibit 3.5; USEPA, September 2001).

For the constituents identified as COPCs in soil, the following dermal absorption factors were used (USEPA, Exhibit 3-4, September 2001):

- Polychlorinated biphenyls (PCBs) - 0.14
- Polynuclear aromatic hydrocarbons (PAHs) - 0.13
- DDT – 0.03
- Chlordane – 0.04
- gamma-BHC – 0.04
- Pentachlorophenol – 0.25
- Dioxins/furans - 0.03
- Arsenic - 0.03
- Cadmium - 0.001
- Semivolatile organics - 0.1

As indicated in RAGS Part E, absorption factors for volatiles and other metals have not been developed due to insufficient data. Therefore, risks from dermal absorption of volatiles and metals (other than arsenic and cadmium) from soil were not quantified in the HHRAs. The uncertainty associated with the omission of these constituents is discussed in the uncertainty analysis.

The same exposure frequencies and durations used in the estimation of ingestion intakes were used to estimate exposure via dermal contact.

2.1.2.3.3 Inhalation of Air and Fugitive Dust/Volatile Emissions

The amount of a chemical a receptor takes in as a result of breathing is determined using the concentration of the contaminant in air. Intakes of both particulates and vapors/gases are calculated using the same equation, as follows (USEPA, December 1991 and July 1996):

$$Intake_{ai} = \frac{(C_{ai})(IR_a)(ET)(EF)(ED)}{(BW)(AT)}$$

where: $Intake_{ai}$ = intake of chemical "i" from air via inhalation (mg/kg/day)

C_{ai} = concentration of chemical "i" in air (mg/m^3)

IR_a = inhalation rate (m^3/hour)

ET = exposure time (hours/day)

EF = exposure frequency (days/year)

ED = exposure duration (year)

PEF	=	Particulate Emission Factor (m^3/kg)
VF	=	Volatilization Factor (chemical-specific) (m^3/kg)
BW	=	body weight (kg)
AT	=	averaging time (days);
	=	for noncarcinogens, AT = ED x 365 days/year;
	=	for carcinogens, AT = 70 year x 365 days/year

As noted above, the State of Florida SCTLs are used calculate cancer and non-cancer risk estimates for the hypothetical future resident and a typical industrial worker. Exposure assumptions for the other receptors are described below and were used to develop risk-based concentrations for the construction worker, the maintenance worker, and the recreational user/trespasser.

The same exposure frequencies and durations used in the estimation of ingestion and dermal intakes of soil were used to estimate exposure via inhalation of air and fugitive dust/volatile emissions. Additionally, for construction/excavation workers and maintenance workers, an inhalation rate of 2.5 m^3 per hour (USEPA, December 2002b) and an exposure time of 8 hours/day (i.e., 20 m^3 per day) were used to evaluate risks from inhalation of fugitive dusts and volatile emissions for the RME scenarios. An inhalation rate of 1.5 m^3 per hour is used for the CTE for these receptors (USEPA, August 1997).

For adult and adolescent trespassers/recreational users, inhalation rates of 1.6 m^3 per hour and 1.2 m^3 per hour (USEPA, August 1997), respectively, and an exposure time of 4 hours per day were used to evaluate risks from inhalation of fugitive dusts and volatile emissions for the RME scenarios. An inhalation rate of 1.0 m^3 per hour was used for the CTE for both receptors (USEPA, August 1997).

The concentrations of chemicals in air resulting from emissions from soil were developed following procedures presented in USEPA Soil Screening Guidance (July 1996 and December 2002b), as follows:

$$C_a = C_s \times \left[\frac{1}{PEF} + \frac{1}{VF}\right]$$

where:	C_a	=	chemical concentration in air, mg/m^3
	C_s	=	chemical concentration in soil, mg/kg
	PEF	=	Particulate Emission Factor, 1.241 x 10^9 m^3/kg (FDEP, August 1999)
	VF	=	chemical-specific Volatilization Factor, m^3/kg

If no volatile chemicals are retained as COPCs in surface and subsurface soil, the above equation reduces to:

$$C_a = C_s \times \left[\frac{1}{PEF}\right]$$

The Particulate Emissions Factor (PEF) relates the concentration of the chemical in soil with the concentration of dust particles in air. The Volatilization Factor (VF) relates the concentration of the chemical in soil with the concentration in ambient air. VFs are calculated according to USEPA Soil Screening Guidance, (July 1996 and December 2002b) using meteorological data specific to NAS Whiting Field. With the exception of the construction worker, the PEF value used to estimate risks from inhalation of fugitive dusts was 1.241 x 10^9 m^3/kg, which was developed by the State of Florida in FAC 62-777 (FDEP, August 1999). The PEF for the construction worker was 2.43 x 10^6 m^3/kg (USEPA, December 2002).

2.1.2.3.4 Exposure to Lead in Soil

The equations and methodology presented in the previous sections cannot be used to evaluate exposure to lead because of the absence of published dose-response parameters. Exposure to lead was assessed using the following models:

- The latest version of the USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead (May 2002). This model is typically used to evaluate lead exposure assuming a residential land use scenario.

- The USEPA’s TRW Model for Lead (January 2003). This model is typically used to evaluate lead exposure assuming a non-residential land use scenario.

In general, the IEUBK Model and TRW Model for lead were used to address exposure to lead when detected soil concentrations exceed the OSWER soil screening level of 400 mg/kg for residential land use (USEPA, July 1994). Average lead concentrations, as well as default values for some input parameters, were used in the evaluation.

The IEUBK Model for lead (USEPA, May 2002) is designed to estimate blood levels of lead in children (under 7 years of age) based on either default or site-specific input values for air, drinking water, diet, dust, and soil exposure. Studies indicate infants and young children are extremely susceptible to adverse effects from exposure to lead. Considerable behavioral and developmental impairments have been noted in children with elevated blood lead levels. The threshold for toxic effects from this chemical is believed to be in the range of 10 to 15 µg/dL. Blood lead levels greater than 10 µg/dL are considered to be a "concern." Estimated blood lead levels and probability density histograms are presented in Appendix B as support documentation for the site-specific risk assessments.

Non-residential adult exposure to lead in soil was evaluated using the USEPA TRW Model for Lead (January 2003). In this model, adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in adult women (and in the developing fetuses of adult women). The adult lead model generates a spreadsheet for each exposure scenario evaluated (i.e., industrial, recreational). The output of the spreadsheet is the probability that the blood lead concentrations in the fetus exceeds 10 µg/L. No models are currently available to evaluate the periodic exposure of adolescent trespassers to lead. Therefore, the results of the IEUBK Model for children are used to qualitatively assess exposure of this receptor. Essentially, the qualitative discussions state that potential adverse effects from exposure to lead are expected to be of a lesser magnitude for adolescent trespassers than for young children.

2.1.3 Toxicity Assessment Protocol

The objective of a toxicity assessment is to identify the potential for human health hazards and adverse effects in exposed populations. A significant portion of the toxicity assessment of the HHRAs has been completed because CSFs and RfDs were selected by the State of Florida during the development of the residential and industrial soil SCTLs defined in Section 2.0. A CSF is an indicator of the potency of a chemical carcinogen (i.e., the greater the CSF, the more potent the carcinogen). An RfD is the dose at or below which adverse non-carcinogenic effects are not anticipated. These factors represent quantitative estimates of the relationship between the magnitude and types of exposures and the severity or probability of human health effects and were used to develop risk-based concentrations as described above.

2.1.3.1 Sources of Toxicity Criteria

Oral and inhalation RfDs and CSFs not already identified in the State of Florida guidance and used in the HHRAs were obtained from the following primary recommended USEPA sources:

- Integrated Risk Information System (IRIS) (online)

- USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center develops PPRTVs on a chemical-specific basis when requested by USEPA's Superfund program.

- Other Toxicity Values – These sources include but are not limited to California Environmental Protection Agency (Cal EPA) toxicity values, the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), and the Annual Health Effects Assessment Summary Tables (HEAST) (USEPA, July 1997)

Although RfDs and CSFs can be found in several toxicological sources, USEPA's IRIS online database, which is continuously updated, is the preferred source of toxicity values. The USEPA Region 9 PRG Tables and Region 3 Risk-Based Concentration (RBC) tables are also used as sources of toxicity criteria when criteria are not available from the aforementioned references.

2.1.3.2 Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in literature are frequently expressed as administered doses; therefore, these values are considered to be inappropriate for estimating the risks associated with dermal routes of exposure. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before comparisons to estimated dermal exposure intakes are made.

The adjustment from administered to absorbed dose was made using chemical-specific absorption efficiencies published in available guidance, including RAGS Part E (the primary reference), IRIS, the draft State of Florida Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-77, FAC, ATSDR toxicological profiles, and the following equations:

$$RfD_{dermal} = (RfD_{oral})(ABS_{GI})$$

$$CSF_{dermal} = (CSF_{oral})/(ABS_{GI})$$

where: ABS_{GI} = absorption efficiency in the gastrointestinal tract

2.1.3.3 Toxicity Criteria for Carcinogenic Effects of PAHs

Limited toxicity values are available to evaluate the carcinogenic effects from exposure to PAHs. The most extensively studied PAH is benzo(a)pyrene, which is classified by the USEPA as a probable human carcinogen. Although CSFs are available for benzo(a)pyrene, insufficient data are available to calculate CSFs for other carcinogenic PAHs. Toxic effects for these chemicals were evaluated using the concept of estimated orders of potential potency, as presented in current USEPA Region 4 guidance (May 2000). Toxicity Equivalence Factors (TEFs), which indicate the potency of each PAH compound relative to that of benzo(a)pyrene, are available for select carcinogenic PAHs. The equivalent oral and inhalation CSFs for PAHs other than benzo(a)pyrene are derived by multiplying the CSF for benzo(a)pyrene by the TEF for the PAH compounds (USEPA Region 4, May 2000). Table 2-10 lists the TEFs used in the revised risk assessments.

These TEFs were used to convert the individual carcinogenic PAH concentrations to an equivalent concentration of benzo(a)pyrene. Both the COPC screening and quantitative risk estimates were based on an evaluation of the equivalent concentrations of benzo(a)pyrene. The carcinogenic PAHs actually detected at least once in a soil dataset were used in the calculation. Non-detect results were assigned a value of ½ the sample quantitation limit prior to the calculation. However, those carcinogenic PAHs not detected in any sample within the dataset were not considered in the calculation. If carcinogenic PAHs were not detected in a sample, ½ the sample quantitation limit presented for benzo(a)pyrene was used to calculate the equivalent concentration of benzo(a)pyrene in that sample.

2.1.3.4 Toxicity Criteria for Chromium

Toxicity criteria are available for different forms of chromium (trivalent and hexavalent), which is considered to be more toxic in the hexavalent state. Because hexavalent chromium is not anticipated to be a site-related contaminant of concern at any of the sites being re-evaluated, the HHRAs for NAS Whiting Field follow the approach used by USEPA Region 9 (October 2002) when evaluating risks for chromium. The Region 9 guidance states the following:

> "IRIS shows an air unit risk of 1.2E-2 per (µg/cu.m) or expressed as an inhalation cancer slope factor (adjusting for inhalation/body weight) of 42 $(mg/kg/day)^{-1}$. However, the supporting documentation in the IRIS file states these toxicity values are based on an assumed 1:6 ratio of Cr6:Cr3." Therefore, Region 9 prefers to present "PRGs based on these cancer toxicity values as "total chromium" numbers in the PRG tables and also include a Cr6 specific value (assuming 100% Cr6) derived by multiplying the "total chromium" value by 7, yielding a cancer potency factor of 290 $(mg/kg\text{-}day)^{-1}$."

The Region 9 residential soil PRG for the 1:6 Cr6:Cr3 ratio is 210 mg/kg/day. This is the same screening value for chromium presented in Florida STCL tables. The 1:6 Cr6:Cr3 ratio approach employed by Region 9 and Florida were used for both the screening and risk characterization evaluations performed as part of the HHRAs.

2.1.3.5 Toxicity Profiles

Toxicological profiles for each COPC selected in the site-specific HHRAs are presented in Appendix B. These brief profiles present a summary of the current available literature on the carcinogenic and non-carcinogenic health effects associated with human exposure to COPCs.

2.1.4 Risk Summarization and Interpretation

Potential risks (non-carcinogenic and carcinogenic) for individual chemicals detected in soils are estimated using the simple risk ratio technique presented in Section 2.0. The total risk from exposure to all COPCs in soil is calculated in accordance with the risk assessment methods outlined in USEPA guidance (December 1989). Risks to human receptors are also characterized per proposed FDEP guidelines/criteria established in draft Rule 62-780, FAC. Supporting documentation for the site-specific HHRAs is presented in Appendix B.

2.1.4.1 Evaluation of Chemicals Other Than Lead

Quantitative estimates of risk for chemicals other than lead were calculated according to risk assessment methods outlined above; the methodology is based on standard USEPA guidance (December 1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities referred to as incremental lifetime cancer risks (ILCRs), which are based on CSFs. An ILCR of $1x10^{-6}$ indicates the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million persons. Cancer risk estimates developed for individual chemicals are summed and presented as the total cancer risk estimate for a receptor. Non-carcinogenic risk estimates for individual chemicals are presented as a HQs, which are based on RfDs. An HQ is the ratio of the intake to the RfD and is an indicator of the potential for adverse non-carcinogenic health effects. An HI is generated by summing the individual HQs for all COPCs. The HI is not a mathematical prediction of the severity of toxic effects and therefore is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of non-carcinogenic (threshold) effects. As discussed below, HIs were calculated on a target organ/target effect basis.

2.1.4.2 Evaluation of Lead

Exposure to lead was assessed using USEPA's (IEUBK) Model for lead and the TRW adult lead model as described in Section 2.3.4. The results of the models were compared to USEPA levels of concern, i.e., predicted lead levels in children and adults should be less than 10 µg/dL and the probability of the blood lead concentrations in a child or fetus exceeding 10 µg/L should be less than 5 percent.

2.1.4.3 Interpretation of Quantitative Risk Assessment Results

To interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates are compared to typical risk benchmarks. Calculated ILCRs are interpreted using the USEPA's target range ($1x10^{-6}$ to$1x10^{-4}$) (i.e., a one-in-ten-thousand to one-in-one-million chance of developing cancer) and the State of Florida goal for a total cancer risk of $1x10^{-6}$. HIs are evaluated using a value of 1.0.

The USEPA has defined the range of $1x10^{-6}$ to$1x10^{-4}$ as the ILCR target range for hazardous waste facilities addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). Individual or cumulative ILCRs greater than $1x10^{-4}$ are generally not considered as protective of human health. The State of Florida has established a cumulative cancer goal of $1x10^{-6}$ for receptors exposed to contaminated environmental media at a site. These benchmarks are used in the interpretation of the risk characterization results.

An HI exceeding unity (1.0) indicates there may be potential non-carcinogenic health risks associated with exposure. However, when an HI exceeds unity, target organs effects associated with exposure to COPCs are considered. Only the HQs for those chemicals affecting the same target organ(s) or exhibit similar critical effect(s) are regarded as truly additive. Consequently, it may be possible for a cumulative HI to exceed 1.0, but no adverse health effects are anticipated if the COPCs do not affect the same target organ or exhibit the same critical effect (i.e., the HIs developed on a target-organ-specific basis do not exceed 1). Individual target organ HIs for all receptors are presented in the risk assessment tables developed for each site-specific risk assessment.

Current USEPA policy regarding lead exposures is to limit the childhood risk of exceeding a 10 µg/dL blood lead level to 5 percent.

2.1.4.4 Risk Characterization Using Draft DEP Rule 62-780, F.A.C.

This section describes the methodology used to evaluate soils at NAS Whiting Field Sites 9 through 18 using guidelines presented in the proposed Florida Rule 62-780 FAC (February 2004), which makes use of a phased risk-based corrective action process that is iterative and tailors site rehabilitation to site-specific conditions and risks. Rule 62-780 is used in conjunction with Chapter 62-777, FAC, which provides the methodology used to establish the FDEP cleanup target levels (CTLs) for the residential and commercial/industrial land use scenarios.

The FDEP risk characterization is performed, in part, through a series of tables in which concentrations of chemicals detected at a site are compared to various FDEP soil criteria or to criteria developed according to guidelines presented in Chapter 62-777 FAC. The soil criteria include SCTLs for direct contact (i.e., ingestion, dermal contact, and inhalation), SCTLs for leachability to groundwater, soil saturation concentrations (C_{sat}) for an evaluation of free product, and background levels for metals. Using the guidance provided in proposed Rule 62-780, the NAS Whiting Field sites were evaluated for the following land use scenarios:

- Residential land use
- Commercial/industrial land use
- Recreational land use

The evaluation of the hypothetical future residential and commercial/industrial land use of a site is described under Risk Management Option Levels I and II, respectively, of the draft Rule 62.780.680. Risk Management Option Level III of the draft rule allows for the development and use of alternative CTLs based on, for example, a site-specific risk assessment. In these risk assessments, alternative CTLs were calculated for a recreational user/trespasser as specified in Section 1.2.3 and Appendix B. FDEP SCTLs for residential and commercial/industrial land use and these alternative CTLs were used to evaluate EPCs for COPCs as described in the following paragraphs. The SCTLs for recreational land use at NAS Whiting Field were calculated using the equations provided in Chapter 62-777 FAC, the most recent toxicological information presented in IRIS, and the exposure factors presented in Section 1.2.3. (It should be noted that a comparison of chemical concentrations detected in soils to the SCTLs for leachability to groundwater is not presented in this report but will be presented in the RI/FS reports for Site 40.)

A site is first evaluated for residential land use (Level I) for each medium (surface or subsurface soil). If the concentrations of chemicals detected at the site are less than their respective criteria, the site is not evaluated further. However, if any of the Level I criteria are exceeded, the site is evaluated for commercial/industrial land use (Level II). The process is then repeated for potential recreational land use (Level III), if necessary. The comparisons conducted for each level are presented in a table with the chemicals exceeding the relevant screening levels (i.e., the potential COCs) highlighted. The Florida risk analysis tables are presented in the site-specific HHRAs (Section 3.0 through 12.0). Supporting documentation is presented in Appendix B, as necessary. The following evaluations for the NAS Whiting Field Sites were performed according to proposed Rule 62-780.680:

- ***Evaluation of maximum detected concentrations and EPCs using SCTLs***. Per guidance provided in a presentation by Dr. Steve Roberts of the University of Florida, maximum detected surface and subsurface soil concentrations are compared to the direct contact SCTLs. (This approach is referred to as Approach 1 for RMO Level 1 and Level 2 soils. Approach 1 was selected for this risk assessment because an initial review of the analytical data, the maximum detected concentrations, and the EPCs (calculated as described in Section 1.2.2) indicated the list of COCs selected for a site would not change if the maximum detected concentration versus the EPC were evaluated using the SCTLs.) If the maximum detected concentration for a chemical exceeds the direct contact SCTL (and background levels for metals), the constituent is identified as a potential

COC for the site and may be further evaluated using the risk-based apportionment approach described below. Conservatively, maximum detected concentrations are also compared to simple apportioned SCTLs in the COPC selection tables. Simple apportioned SCTLs are based on carcinogenic or non-carcinogenic health effects and were developed according to the apportionment approach presented in Rule Development Workshop for Chapters 62-770, -777, -780, and -785, FAC, Additive Effects and Apportionment (FDEP, online at http://fdep.ifas.ufl.edu/). For carcinogens, the value of the simple apportioned SCTL is calculated by dividing the non-apportioned SCTL (residential, commercial/industrial, or recreational) by the number carcinogenic chemicals detected in a surface or subsurface soil dataset. For noncarcinogens, the simple apportioned SCTL is determined by dividing the non-apportioned SCTL by the number of chemicals impacting the same target organ. For example, if five carcinogens were detected in a surface soil dataset for a site, the simple apportioned SCTLs for carcinogens are the non-apportioned SCTLs divided by 5 (FDEP, August 1999). If the liver, for example, is identified as the target organ for seven noncarcinogens in a dataset, the simple apportioned SCTLs for those chemicals are the non-apportioned values divided by 7.

- ***Evaluation of maximum detected concentrations using acute-effects based SCTLs.*** The residential non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, cyanide, and phenol are based on acute toxicity considerations. Therefore, simple apportioned SCTLs were not calculated for these chemicals because apportionment is typically applied to SCTLs based on chronic effects. Chemicals with acute SCTLs were evaluated by comparing the maximum concentrations to the non-apportioned acute SCTL values. Commercial/industrial and recreational SCTLs are based on chronic effects only. Therefore, acute-effects based SCTLs were not used in the risk characterizations for the commercial/industrial or recreational land use scenarios.

- ***Comparison of maximum detected concentrations to non-apportioned SCTLs (i.e., the three times rule).*** If the ratio of the maximum concentration of a chemical in soil to the non-apportioned SCTL is greater than 3 (and site concentrations exceed background levels for metals), the chemical is identified as a potential COC.

- ***Evaluation of EPCs using risk-based apportionment.*** Risk-based apportionment is an alternate method of developing apportioned SCTLs for a site, as opposed to the simple apportioned SCTLs described above. The rationale for risk-based apportionment is provided in the Draft Technical Report: Development of Cleanup Target Levels (CTLs) for Chapter 62-777, FAC, (FDEP, February 2004). Page 67 of this document states:

"If risks are unevenly distributed among chemicals at a site, the simple method of apportionment ……for describing site-specific CTLs may lead to a total site risk below the goals of total cancer risk of 1 x 10^{-6} and a hazard index of 1. In these circumstances, within the context of a site-specific risk assessment, a weighted approach may be more appropriate." The following example of risk-based apportionment is provided in the above mentioned document. "For example, consider the situation of four chemicals that affect the same target organ, each with an SCTL of 1 mg/kg. Chemical A is present at 0.05 mg/kg, Chemical B at 0.1 mg/kg, Chemical C at 0.25 mg/kg, and Chemical D at 0.9 mg/kg. Since there are four chemicals present that affect the same target organ, the SCTL for each would be divided by 4 — in this case leading to an SCTL of 0.25 mg/kg for each. In this example, only chemical D poses a potential problem (i.e., it is present at a concentration greater than its modified SCTL of 0.25 mg/kg). Cleanup of Chemical D to its SCTL of 0.25 mg/kg would lead to a total hazard index of only 0.65 for all four chemicals. If a weighted apportionment is used instead, Chemical D could be cleaned to 0.6 instead of 0.25 mg/kg, and still retain a hazard index ≤ 1."

The rationale and examples of calculating risk-based apportioned SCTLs are also provided in a presentation by Dr. Steven Roberts and Dr. Hugo Ochoa titled Rule Development Workshop, Chapters 62-770,- 777, -780, FAC, Additive Effects and Apportionment (http://fdep.ifas.ufl.edu/).

As demonstrated in the preceding example, risk-based apportionment is performed on a chemical by chemical basis when it is feasible and appropriate, as determined by the human health risk assessor. In practice, risk-based apportionment is often an option when cumulative quantitative risk assessment results derived as described in preceding sections are less than FDEP risk benchmarks (i.e., a cancer risk estimate of 1E-06 for carcinogens and an HI of 1 for noncarcinogens).

- ***Evaluation of Free Product in Soil***. The potential for the presence of free product (for organic chemicals) was evaluated by comparing maximum site concentrations to C_{sat} limits. The C_{sat} values are provided in Table 8 of Chapter 62-777 FAC (FDEP, August 1999). The C_{sat} comparisons indicated the concentrations of all organic chemicals detected in soil at the sites evaluated in this report were significantly less than the C_{sat} levels. Therefore, it is unlikely these chemicals are present as free product at any of the sites. However, a C_{sat} value is not currently available for TRPH, and high concentrations of TRPH were detected at some sites (e.g., Sites 17 and 18).

2.1.5 <u>Human Health Risk Uncertainty Analysis</u>

The site-specific baseline risk assessments included an uncertainty analysis in which major sources of uncertainty in the data evaluation, exposure assessment, toxicity assessment, and risk characterization were quantitatively addressed. Probabilistic risk assessment techniques may be recommended to provide risk managers with a more comprehensive understanding of the uncertainty associated with the quantitative risk assessment results. The following subsections present an overview of uncertainties potentially addressed in the site-specific risk assessment uncertainty sections.

2.1.5.1 Uncertainty in Data Evaluation

This section may discuss uncertainties in the risk assessment associated with the analytical data and data quality. This may also involve a discussion of uncertainty in the COPC selection process, the inclusion or exclusion of COPCs in the risk assessment on the basis of background concentrations, the uncertainty in COPC screening levels, and the omission of constituents for which health criteria are not available.

2.1.5.2 Uncertainty in the Exposure Assessment

This section typically includes a discussion of the following: assumptions related to current and future land use; the uncertainty in EPCs, for example, the use of maximum concentrations to estimate risks; uncertainty in the selection of potential receptors and exposure scenarios; and uncertainty in the selection of exposure parameters (RME versus CTE).

2.1.5.3 Uncertainty in the Toxicity Assessment

The uncertainties inherent in RfDs and CSFs and use of available criteria are discussed as necessary. A discussion of the uncertainty in hazard assessment, which deals with characterizing the nature and strength of the evidence of causation, or the likelihood a chemical that induces adverse effects in animals will also induce adverse effects in humans, may be provided. This section also discusses uncertainty in the dose-response evaluations for the COPCs, which relate to the determination of a CSF for the carcinogenic assessment and to the derivation of an RfD or Reference Concentration (RfC) for the non-carcinogenic assessment. In addition, a discussion of the uncertainty in the toxicity of specific constituents such as PAHs, arsenic, chromium, aluminum, iron, and copper is presented, if applicable.

2.1.5.4 Uncertainty in the Risk Characterization

This section discusses the uncertainty in risk characterization resulting primarily from assumptions made regarding additivity/synergism of effects from exposure to multiple COPCs affecting different target organs across various exposure routes. The risk assessment may discuss the uncertainty inherent in summing risks for several substances across different exposure pathways. Probabilistic risk assessment techniques may also be recommended to further define the uncertainty attached to the risk characterization results. However, the exposure assumptions (e.g., probability distributions) used to prepare the probabilistic risk assessment will be discussed with the regulatory reviewers before they are incorporated into the uncertainty section of the baseline risk assessments.

2.1.6 Development of Risk-Based Remedial Options

The site-specific HHRAs include a section outlining the remedial goal options (RGOs) for COCs identified for each environmental medium. COCs are COPCs that significantly contribute to receptor risk estimates exceeding risk management benchmarks and may trigger the need for environmental remediation. RGOs are either medium-specific, risk-based cleanup levels or potential chemical-specific Applicable, Relevant, and Appropriate Requirements (ARARs). Potential risk-based RGOs representing three cancer risk levels ($1x10^{-6}$, $1x10^{-5}$, and $1x10^{-4}$) and three HQ levels (0.1, 1, and 3) are presented for the COCs.

2.2 ECOLOGICAL RISK ASSESSMENT PROTOCOL

The existing ERAs for Sites 11 and 16 at NAS Whiting Field performed by HLA were re-evaluated and updated to assure they are in compliance with current Navy, USEPA, and State of Florida guidance/methods and to update any risk assessment results with potential impact on risk management decisions for these sites. The goal of the SLERA re-evaluations was to identify the chemicals detected at concentrations exceeding applicable screening levels, the locations where these screening levels are exceeded, and the potential need for further investigation. This re-evaluation provides information to risk managers to enable them to conclude either the ecological risks for the subject sites are most likely negligible or whether further information is necessary to better evaluate potential ecological risks.

The ERAs for Sites 11 and 16 consist of two of the eight steps required by USEPA guidance (June 1997 and June 2001) and Navy Policy for Conducting Ecological Risk Assessments. The first step is the screening level assessment. Step 3a or the Refinement step is the first step of the baseline ecological risk assessment process and consists of refining the list of COPCs retained following the screening level assessment.

2.2.1 Screening Level Assessment

Screening is the comparison of site media concentrations with conservative toxicologically based numbers. In the screening level analysis, maximum site concentrations were compared to medium-specific guidelines to provide a conservative estimate of potential ecological risk. Surface soil is the only affected medium to be evaluated in the Sites 11 and 16 risk assessments. The objective of the screening level analysis was to identify COPCs potentially contributing to potential ecological risk.

2.2.1.1 Screening Level Ecological Effects Evaluation

The screening level effects evaluation establishes constituent exposure levels representing conservative thresholds for adverse ecological effects. The toxicity screening values used in this screening are threshold concentrations below which effects are rare and above which effects are more likely. The screening values are set conservatively to minimize the potential for disregarding potentially significant effects.

The USEPA Region 4 has published screening values for surface soil based on a literature review by the Westinghouse Savannah River Company, Savannah River Technology Center (Friday, November 1998). The screening values are presented in the site-specific ecological COPC selection tables presented in Sections 5.0 and 10.0. USEPA Region 4 screening values are not available for the nutrients calcium, magnesium, potassium, and sodium. These metals were not considered candidates for inclusion as COPCs and were not carried forth in the analysis. They are essential nutrients, are well tolerated, and not toxic except at extremely elevated levels.

2.2.1.2 Screening Level Risk Calculation

In the screening level assessment, ecological risk is characterized by comparing maximum concentrations detected in surface soil to the USEPA Region 4 screening levels. Chemicals with no screening levels are carried forward in the risk assessment as COPCs. Results are interpreted through the use of the "quotient method." HQs for direct toxicity screening were calculated by dividing the maximum environmental concentration for each constituent by the corresponding screening value. An HQ less than 1.0 for a chemical in a particular exposure pathway indicates risk is unlikely, and no further investigation of the chemical in the associated exposure pathway is warranted.

2.2.2 <u>Food-Chain Modeling</u>

In accordance with USEPA Region 4 guidance, bioaccumulative compounds identified as COPCs in the screening level risk calculation are further analyzed in food-chain modeling. The USEPA (February 2000) has published a list of important bioaccumulative compounds, and the COPCs on this list were included in the food-chain modeling conducted as part of the ERAs. Although several PAHs are included in the list of bioaccumulative compounds, USEPA Region 4 typically does not require the inclusion of PAHs in food-chain models unless present in percent concentrations (i.e., exceedingly elevated).

2.2.2.1 Assessment and Measurement Endpoints

An assessment endpoint is defined as "an explicit expression of actual environmental values (e.g., ecological resources) that are to be protected" (USEPA, June 1997). A measurement endpoint is a "measurable biological response to a stressor that can be related to the valued characteristics chosen as the assessment endpoint" (USEPA, June 1997).

A review of the 1999 and 2000 RIs indicated the CSM and the assessment and measurement endpoints used in original ERAs appear applicable to the site's present status. The guilds selected for food-chain modeling are based on those modeled in the previous RIs; however, the receptors selected for food-chain modeling were modified from those previously used. Receptors for food-chain modeling were selected based on the species identified in Tables 4-1 and 4-2 of the Initial Assessment Study of NAS Whiting Field (Envirodyne, 1985). Modeled receptors included cotton mouse (mammalian herbivore), short-tailed shrew (mammalian insectivore), bobwhite (avian herbivore), robin (avian insectivore), hawk (avian carnivore), and the gray fox (mammalian carnivore). The only species used in food-chain modeling not identified within the Initial Assessment Study is the robin. The robin was selected for inclusion as an insectivore because its body weight-to-ingestion rate ratio provides a conservative surrogate for risk assessment and because of its common occurrence in the environment over a broad geographical span. Input for the screening level food-chain model includes maximum concentrations of the bioaccumulative COPCs and conservative exposure parameters from USEPA's Wildlife Exposure Factors Handbook (December 1993).

2.2.2.2 Food-Chain Modeling Exposure Estimates

The exposure of terrestrial receptors to COPCs in surface soil was evaluated by estimating the daily doses in mg/kg/day using exposure equations. The maximum bioaccumulative COPC concentrations in the surface soil were used to calculate the chronic daily intake (CDI) doses. The following equation presents a generic food-chain model used for the surrogate species selected for modeling:

$$\text{CDI Dose (mg/kg/day)} = \frac{(\text{MFI} * \text{MFC}) + (\text{MWI} * \text{MSW}) + (\text{MSI} * \text{MSC})}{\text{MBW}}$$

Where: MFI = Maximum food ingestion rate
MFC = Maximum food concentration
MWI = Maximum surface water ingestion rate
MSW = Maximum surface water concentration
MBW = Minimum body weight
MSI = Maximum incidental sediment ingestion rate
MSC = Maximum sediment concentration

No source of drinking water is present at Sites 11 or 16, so it is presumed a non-site source of surface water is used by receptors. Consequently, factors addressing drinking water ingestion are not included in the food chain ingested dose equation above.

For inorganic and organic constituents in surface soil, the contaminant concentration of the food items (i.e., plants, earthworms, small mammals) was calculated using the following equation:

$$FC = SC * BAF$$

Where: FC = Contaminant concentration in food

SC = Contaminant concentration in surface soil

BAF = Bioaccumulation Factor

Plant, soil invertebrate, and small mammal Bioaccumulation Factor (BAFs) are simple ratios of constituent concentrations in the target organisms to soil concentrations. In the absence of USEPA BAF values, the primary source of BAFs are Oak Ridge National Laboratory (ORNL) publications and databases such as the ORNL Risk Assessment Information System Electronic Database, which have data relating organism and soil concentrations (ORNL, 1998a and September 1998b; Sample et al., February 1998a; Sample et al., February 1998b; RAIS, 2004). Other literature sources are used, if necessary (Beyer, July 1990). All estimated organism constituent concentrations were corrected for wet weight using appropriate conversion factors. The BAFs are presented in the site-specific risk assessments (i.e., Sections 5.0 and 10.0).

2.2.2.3 Toxicity Reference Values

Ecotoxicity values used in food-chain modeling are based on No-Observed-Adverse-Effect Levels (NOAELs) and Lowest-Observed-Adverse-Effect Levels (LOAELs) from the literature. The use of NOAELs for toxicity reference values (TRVs) is appropriate for screening level assessments to ensure risk is not underestimated. Selection of NOAELs from the literature is based on the species tested, the route of exposure, the duration of the study, and the measured effect.

The primary source of TRVs used was the ORNL document entitled Toxicological Benchmarks for Wildlife: 1996 Revision (Sample et al., June 1996). If the cited ORNL document did not have appropriate TRVs, other sources used include the Hazardous Substance Data Base (HSDB), the IRIS, ATSDR toxicological profile documents, and individual studies from toxicological journals. For consistency, NOAELs and LOAELs derived from sources other than ORNL are subjected to the same methodology used in the ORNL document. If a TRV cannot be identified for a particular chemical, potential risk cannot be estimated. The absence of this information was identified as an uncertainty and the potential impacts on the conclusions discussed in the uncertainty sections.

In selecting studies for TRV derivation, emphasis was placed on those studies in which: (1) reproductive and developmental endpoints are considered (i.e., endpoints potentially directly related to potential population-level effects), (2) multiple exposure levels are investigated, and (3) the reported results are evaluated statistically to identify significant differences from control values (Sample et al., June 1996).

2.2.2.4 Estimation of Food-Chain Risk

In the food-chain model, HQs were calculated by dividing each modeled dose by the corresponding TRV. As in the direct-toxicity screening, an HQ less than 1.0 indicates risk is unlikely, and no further investigation of the chemical in the associated exposure pathway is warranted.

2.2.3 Refinement of COPCs

The objective of the refinement step (i.e., Step 3a) is to better define those constituents potentially contributing unacceptable levels of ecological risk and to identify and eliminate from further consideration those COPCs initially retained because of the use of very conservative exposure scenarios. The refinement step includes consideration of site-specific parameters such as spatial distribution and frequency of detection, receptor home range, constituent bioavailability, and background in defining those COPCs associated with the highest potential risk at the site. Additionally, screening criteria other than the USEPA Region 4 soil screening levels are compared to site COPC concentrations to reduce the uncertainty associated with using very conservative screening values and the consequential overestimates of potential risk and to assist in characterizing spatial distribution of potential risk. Using less conservative assumptions, screening level risk estimates were re-calculated for those constituents identified as COPCs in the screening level analysis and these new estimates used to refine the list of COPCs.

2.2.3.1 Exposure Concentrations

In the initial screening level exposure estimates and risk calculations, maximum detected constituent concentrations in affected media are used as the EPCs. The maximum reported concentration was assumed to apply to the entire site, thereby maximizing receptor exposure. In the refinement step, mean rather than maximum concentrations of COPCs were used in the direct toxicity and food-chain model risk calculations.

Arithmetic means were calculated for all data, combining duplicates with associated samples, and substituting a value of one-half the detection limit for those concentrations reported as less than detection levels. Means calculated in this manner were compared to means computed from detected concentrations only, and the lowest mean value was used to assess risk to avoid bias from detection limits reported at levels much higher than estimated values.

2.2.3.2 Exposure Parameters

In contrast to the use of exposure parameters that maximize the modeled dose to receptors in the screening level food-chain models, average exposure parameters (i.e., ingestion rates, body weight) were applied to the same models in the refinement step. Average exposure parameters used in refinement food-chain models were derived from data in USEPA (December 1993). In the screening level assessment, a Site Use Factor (SUF) of 1.0 was used indicating the receptor spends 100 percent of its time at the site (i.e., in the area of maximum contaminant concentration). However, actual exposure is a function of the home range of the receptor (i.e., how large an area the receptor normally covers in its day-to-day activities related to feeding) and the areal extent of contamination. In the refinement food-chain models, SUFs are calculated by dividing the site area by the mean home range of the receptor. Conservatively, a minimum SUF value of 0.1 is used. For those receptors with home ranges less than the area of the site, the SUFs remain equal to 1.0. The SUF is incorporated into the food-chain model dose calculations to account for differences between site size and receptor home range.

2.2.3.3 Estimations of Range of Risk

The lower bound of the threshold effects is based on consistently conservative assumptions and NOAEL toxicity values (USEPA, June 1997). This bound presents the highest potential risks. The upper bound is based on observed impacts or predictions that ecological effects could occur and were developed using consistent assumptions, site-specific data, LOAEL toxicity values, or an impact evaluation (USEPA, June 1997). This bound presents the average potential risk. Both the upper and lower bounds are evaluated to provide the overall range of potential risks as presented in the following table:

Conservative Scenario	Average Scenario
Maximum surface soil concentration	Average surface soil concentration
90-percent BAF value from the literature (when available)	Median BAF value from the literature (when available)
Highest receptor body weight for NOAEL calculation	Average receptor body weight for LOAEL calculation
Lowest receptor body weight for CDI equation	Average receptor body weight for CDI equation
Conservative receptor ingestion rate	Average receptor ingestion rate
Use NOAELs	Use LOAELs
Receptors spend 100 percent of their time at the site	Receptor's home range taken into account

2.2.3.4 Comparison to Other Guidelines

Potential risks to terrestrial plants and invertebrates resulting from exposure to the COPCs were further evaluated by comparing the contaminant concentrations in surface soil to soil benchmark values other than the USEPA Region 4 soil screening levels. The following list presents these other soil guidelines developed by a few groups/agencies:

- Dutch Intervention Values and Target Values – Soil Quality Standards (MVROM, February 2000)

- Canadian Soil Quality Guidelines (CCME, March 1997)

- Oak Ridge National Laboratory Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision (Efroymson R.A., et al., November 1997a)

- Oak Ridge National Laboratory Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision (Efroymson R.A., et al., November 1997b)

- United States Fish and Wildlife Service (Beyer, July 1990)

Additional details explaining the origin and basis for these guidelines are provided below.

The Intervention Values and Target Values – Soil Quality Standards were developed by the Netherlands Ministry of Housing, Spatial Planning, and Environment, Department of Soil Protection and are referred to as the Dutch Screening Values (MVROM, February 2000). The Dutch Screening Values for surface soil consist of Target Values and Intervention Values. A Target Values is a soil quality level at which there is sustainable soil quality. The Intervention Values indicate the concentration levels of contaminants in the soil above which the functionality of the soil for human, plant, or animal life is seriously impaired or threatened. The Target Value is used to determine ecological effects and the need for additional evaluation of the data. The Intervention Value is used to characterize the potential presence of highly elevated contamination (hotspot).

The Canadian Soil Quality Guidelines were developed by the Canadian Council of Ministers of the Environment (March 1997) using toxicological data to determine the threshold level for key receptors. The values are calculated for four land uses: agricultural, residential/parkland, commercial, and industrial. Exposure from direct soil contact is used to derive guidelines for the residential/parkland, commercial, and industrial land uses. However, the soil guidelines for the agricultural land use incorporate direct soil contact as well as soil and food ingestion (CCME, March 1997).

The guidelines presented in Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision (Efroymson R.A., et al., 1997a) and the Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision (Efroymson R.A., et al., November 1997b) were developed by ORNL to be used as screening values, and as such, may be overly conservative. They are based on a 20-percent reduction in growth, reproduction, or activity (for invertebrates) or growth and yield (for plants) as the threshold for significant effects (Efroymson R.A., et al., November 1997a and November 1997b).

The United States Fish and Wildlife Service (USFWS) guidelines (Beyer, July 1990) are one of the earliest compilations of soil screening values and contains a list of over 200 contaminants from Japan, Netherlands, Canada, United States, and the former Soviet Union. Screening levels from the Netherlands, which are sanctioned by USEPA Region 4, were taken from the interim Dutch Soil Cleanup Act values issued in the 1980s. Two categories from these guidelines are used. Category A refers to background concentrations in soil or detection limits, and category B refers to moderate soil contamination potentially requiring additional study.

2.2.4 Uncertainties

Areas of uncertainty discussed in the previous risk assessments performed for Sites 11 and 16 were reviewed for completeness. Any supplemental uncertainties identified during the preparation of the updated risk assessments are documented in Section 5.0 and 10.0. Some of the uncertainties typically associated with ecological risk assessments are presented in the following paragraphs.

2.2.4.1 Measurement and Assessment Endpoints

Measurement endpoints are used to evaluate the assessment endpoints selected for the risk assessment. The measures of effects are not always the same as the assessment endpoints; therefore, the measures are used to predict effects to the assessment endpoints by selecting surrogate species to be evaluated. For example, a decrease in reproduction of a shrew is used to assess a decrease in reproduction of the small mammal population. However, predicting a decrease in reproduction of a shrew may either underprotect or overprotect the small mammal population, resulting from differences in ingestion rates, toxicity, food preferences, etc. between different species.

2.2.4.2 Exposure Characterization

The contaminant dose to terrestrial wildlife is calculated using an equation incorporating ingestion rates, body weights, bioaccumulation factors, and other exposure factors. These exposure factors are obtained from literature studies or predicted using various equations. Ingestion rates and body weights vary between species, especially between species inhabiting different areas (USEPA, December 1993).

The bioaccumulation of contaminants into various biological media (i.e., plants, invertebrates, small mammals) depends on characteristics of the media such as pH, organic carbon, etc. Therefore, actual BAFs at the sites may be different than those obtained from the literature. Also, the bioavailability of the chemicals is not considered in the risk assessment. All of the chemicals are assumed to be 100 percent bioavailable at the detected concentrations, which is unlikely to occur for contaminants in the environment.

There is uncertainty in the chemical data collected at the site. Measured levels of chemicals are only estimates of the true site chemical concentrations. For samples deliberately biased toward known or suspected high concentrations, predicted doses based on these concentrations are probably higher than actual doses.

Finally, under the conservative exposure scenario, terrestrial wildlife is assumed to live and feed only at the site. This assumption tends to overpredict risk because it is unlikely most receptors obtain all their food from within the site boundaries and from the most contaminated areas.

2.2.4.3 Ecological Effects Data

Potentially adverse impacts to terrestrial plants and invertebrates from constituents in surface soil are evaluated by comparing COPC concentrations to surface soil screening levels. The surface soil screening levels may be based on the results of only a few studies. In addition, they may be based on different endpoints depending on the preference of the agency responsible for developing them.

The NOAELs selected for the wildlife endpoint species were based on species other than the endpoint species (i.e., rats, mice, ducks). There is uncertainty in the application of toxicity data across species because a contaminant may be more or less toxic to the endpoint species than it was to the test study species.

The toxicity of chemical mixtures is not well understood. All of the toxicity information used in the ERAs for evaluating risk to ecological receptors was for individual chemicals. Chemical mixtures can affect the organisms very differently than the individual chemicals because of synergistic or antagonistic effects.

Finally, toxicological data for a few of the COPCs are limited or do not exist. Therefore, there is uncertainty in any conclusions involving the potential impacts to ecological receptors from these constituents.

2.2.4.4 Risk Characterization

Risks are possible if a HQ is greater than or equal to unity regardless of the magnitude of the HQ. However, the magnitude of effects to ecological receptors cannot be inferred based on the magnitude of the HQ; an HQ greater than 1.0 simply indicates the dose used to derive the TRV was exceeded. Finally, there is uncertainty in how the predicted risks to a species at a site translate into risk to the population in the area as a whole.

2.2.5 Conclusions

Based on the results of the re-evaluation screening level and refinement analyses, conclusions are provided regarding COPCs for the specific sites, those COPCs contributing most to potential ecological risks at the respective sites, a qualitative (and if possible quantitative) estimate of the spatial extent of potential ecological risk, and, the identification of any data gaps or deficiencies in the previous risk assessments potentially affecting risk management decisions. The results of actual toxicity testing conducted for Sites 11 and 16 are also considering in the development of the site-specific conclusions.

TABLE 2-1

**EXPOSURE ROUTES FOR QUANTITATIVE EVALUATION
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA**

Receptors	Exposure Routes
Adult and Adolescent Trespassers / Recreational Users	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions (surface soil)
Maintenance Workers	• Soil dermal contact (surface) • Soil ingestion (surface) • Inhalation of air/dust/emissions (surface)
Construction Workers	• Soil dermal contact (surface and subsurface) • Soil ingestion (surface and subsurface) • Inhalation of air/dust/emissions (surface and subsurface)
Occupational Workers	• Soil dermal contact (surface)[1] • Soil ingestion (surface)[1] • Inhalation of air/dust/emissions (surface)[1]
Residents (Adult/Children)	• Soil dermal contact (surface)[1] • Soil ingestion (surface)[1] • Inhalation of air/dust/emissions (surface)[1]

1 Occupational workers and residents are evaluated for exposure to chemicals of potential concern (COPCs) in subsurface soil. This scenario is included to account for the possibility that subsurface soil could be brought to the surface in future excavation projects.

TABLE 2-2

DAILY INTAKE VALUES FOR CALCULATION OF EXPOSURE OF CONSTRUCTION / EXCAVATION WORKERS TO SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Future Medium: Soil Exposure Medium: Soil Exposure Point: Entire Site Receptor Population: Construction/Excavation Worker Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation
Ingestion	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Ingestion CDI[1] (mg/kg/day) =
	IR	Ingestion Rate of Soil	mg/day	330	USEPA, December 2002	330	USEPA, December 2002	Csoil x IR x Fi x EF x ED x CF
	Fi	Fraction Ingested	--[2]	1.0	Professional Judgement	1.0	Professional Judgement	BW x AT
	EF	Exposure Frequency	days/year	250	USEPA, December 2002	219	USEPA, May 1993	USEPA, December 1989
	ED	Exposure Duration	years	1	Professional Judgement	1	Professional Judgement	
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, December 1989	365	USEPA, December 1989	
Dermal	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL	USEPA, May 1993	95% UCL	USEPA, May 1993	Dermal CDI[1] (mg/kg/day) =
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	Csoil x CF x SA x AF x ABS x EF x ED
	SA	Skin Surface Area	cm^2/day	3,300	USEPA, September 2001	3,300	USEPA, September 2001	BW x AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.3	USEPA, September 2001	0.1	USEPA, September 2001	USEPA, December 1989
	ABS	Dermal Absorption Factor (Solid)	unitless	chemical-specific	USEPA, September 2001	chemical-specific	USEPA, September 2001	
	EF	Exposure Frequency	days/year	250	USEPA, December 2002	219	USEPA, May 1993	
	ED	Exposure Duration	years	1	Professional Judgement	1	Professional Judgement	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, December 1989	365	USEPA, December 1989	

1 CDI = Chronic Daily Intake
2 Unitless; no units are associated with this parameter.

TABLE 2-3

DAILY INTAKE VALUES FOR CALCULATION OF EXPOSURE OF MAINTENANCE WORKERS TO SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Entire Site
Receptor Population: Maintenance Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation
Ingestion	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Ingestion CDI[1] (mg/kg/day) =
	IR	Ingestion Rate of Soil	mg/day	50	FDEP, August 1999	50	FDEP, August 1999	Csoil x IR x Fi x EF x ED x CF
	Fi	Fraction Ingested	--[2]	1.0	USEPA, May 1993	1.0	USEPA, May 1993	BW x AT
	EF	Exposure Frequency	days/year	30	ABB-ES, January 1998	30	ABB-ES, January 1998	USEPA, December 1989
	ED	Exposure Duration	years	25	USEPA, May 1993	9	USEPA, May 1993	
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, December 1989	3,285	USEPA, December 1989	
Dermal	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Dermal CDI[1] (mg/kg/day) =
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	Csoil x CF x SA x AF x ABS x EF x ED
	SA	Skin Surface Area	cm^2/day	3,300	USEPA, September 2001	3,300	USEPA, September 2001	BW x AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	USEPA, September 2001	0.02	USEPA, September 2001	USEPA, December 1989
	ABS	Dermal Absorption Factor (Solid)	unitless	chemical -specific	USEPA, September 2001	chemical -specific	USEPA, September 2001	
	EF	Exposure Frequency	days/year	30	ABB-ES, January 1998	30	ABB-ES, January 1998	
	ED	Exposure Duration	years	25	USEPA, December 1989	9	USEPA, December 1989	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	USEPA, December 1989	3,285	USEPA, December 1989	

1 CDI = Chronic Daily Intake
2 Unitless; no units are associated with this parameter.

TABLE 2-4

DAILY INTAKE VALUES FOR CALCULATION OF EXPOSURE OF ADULT TRESPASSERS / RECREATIONAL USERS TO SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Entire Site
Receptor Population: Trespasser/Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation
Ingestion	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Ingestion CDI[1] (mg/kg/day) =
	IR	Ingestion Rate of Soil	mg/day	100	USEPA, May 1993	50	USEPA, May 1993	$\frac{\text{Csoil x IR x Fi x EF x ED x CF}}{\text{BW x AT}}$
	Fi	Fraction Ingested	--[2]	1.0	USEPA, May 1993	1.0	USEPA, May 1993	
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	USEPA, December 1989
	ED	Exposure Duration	years	20	ABB-ES, January 1998	20	ABB-ES, January 1998	
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	7,300	USEPA, December 1989	7,300	USEPA, December 1989	
Dermal	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Dermal CDI[1] (mg/kg/day) =
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	$\frac{\text{Csoil x CF x SA x AF x ABS x EF x ED}}{\text{BW x AT}}$
	SA	Skin Surface Area	cm^2/day	5,700	USEPA, September 2001	5,700	USEPA, September 2001	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.07	USEPA, September 2001	0.01	USEPA, September 2001	USEPA, December 1989
	ABS	Dermal Absorption Factor (Solid)	unitless	chemical -specific	USEPA, September 2001	chemical -specific	USEPA, September 2001	
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	ED	Exposure Duration	years	20	ABB-ES, January 1998	20	ABB-ES, January 1998	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	7,300	USEPA, December 1989	7,300	USEPA, December 1989	

1 CDI = Chronic Daily Intake
2 Unitless; no units are associated with this parameter.

TABLE 2-5

DAILY INTAKE VALUES FOR CALCULATION OF EXPOSURE OF ADOLESCENT TRESPASSERS / RECREATIONAL USERS TO SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Soil
Exposure Point: Entire Site
Receptor Population: Trespasser/Recreational User
Receptor Age: Child (7 to 16 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CTE Value	CTE Rationale/ Reference	Intake Equation
Ingestion	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Ingestion CDI[1] (mg/kg/day) =
	IR	Ingestion Rate of Soil	mg/day	100	USEPA, May 1993	100	USEPA, May 1993	Csoil x IR x Fi x EF x ED x CF
	Fi	Fraction Ingested	--[2]	1.0	USEPA, May 1993	1.0	USEPA, May 1993	BW x AT
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	USEPA, December 1989
	ED	Exposure Duration	years	10	ABB-ES, January 1998	10	ABB-ES, January 1998	
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	
	BW	Body Weight	kg	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	USEPA, December 1989	3,650	USEPA, December 1989	
Dermal	Csoil	Chemical Concentration in Soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Dermal CDI[1] (mg/kg/day) =
	CF	Conversion Factor	kg/mg	1.0E-06	USEPA, December 1989	1.0E-06	USEPA, December 1989	Csoil x CF x SA x AF x ABS x EF x ED
	SA	Skin Surface Area	cm^2/day	3,280	USEPA, August 1997	3,100	USEPA, August 1997	BW x AT
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.3	USEPA, September 2001	0.04	USEPA, September 2001	USEPA, December 1989
	ABS	Dermal Absorption Factor (Solid)	unitless	chemical -specific	USEPA, September 2001	chemical -specific	USEPA, September 2001	
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	ED	Exposure Duration	years	10	ABB-ES, January 1998	10	ABB-ES, January 1998	
	BW	Body Weight	kg	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	USEPA, December 1989	3,650	USEPA, December 1989	

1 CDI = Chronic Daily Intake
2 Unitless; no units are associated with this parameter.

TABLE 2-6

DAILY INTAKE VALUES FOR CALCULATION OF
EXPOSURE OF CONSTRUCTION/EXCAVATION WORKERS BY INHALATION OF PARTICULATES/VAPORS FROM SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Future
Medium: Surface and Subsurface Soil
Exposure Medium: Air
Exposure Point: Entire Site
Receptor Population: Construction/Excavation Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation
Inhalation	CS	Chemical concentration in soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Intake (mg/kg/day) = $\frac{CS \times IR \times \left[\frac{1}{VF} + \frac{1}{PEF}\right] \times ET \times EF \times ED}{BW \times AT}$
	VF	Volatilization factor - Chemical Specific	m^3/kg	(1)	USEPA, December 2002	(1)	USEPA, December 2002	
	PEF	Particulate emission factor	m^3/kg	2.43E+06	USEPA, December 2002	2.43E+06	USEPA, December 2002	
	IR	Inhalation Rate	$m^3/hour$	2.5	USEPA, December 2002	1.5	USEPA, August 1997	
	ET	Exposure Time	hours/day	8	USEPA, December 2002	8	USEPA, December 2002	
	EF	Exposure Frequency	days/year	250	USEPA, December 2002	219	USEPA, May 1993	
	ED	Exposure Duration	years	1	Professional Judgement	1	Professional Judgement	
	BW	Body Weight	kg	70	USEPA, December 1989	70	USEPA, December 1989	
	AT-C	Averaging Time (Cancer)	days	25550	USEPA, December 1989	25550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	USEPA, December 1989	365	USEPA, December 1989	

Notes:

(1) - Calculated according to USEPA Soil Screening Guidance, December 2002.

TABLE 2-7

DAILY INTAKE VALUES FOR CALCULATION OF
EXPOSURE OF MAINTENANCE WORKERS BY INHALATION OF PARTICULATES/VAPORS FROM SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air
Exposure Point: Entire Site
Receptor Population: Maintenance Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation
Inhalation	CS	Chemical concentration in soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Intake (mg/kg/day) = $\dfrac{CS \times IR \times \left[\dfrac{1}{VF} + \dfrac{1}{PEF}\right] \times ET \times EF \times ED}{BW \times AT}$
	VF	Volatilization factor - Chemical Specific	m^3/kg	(1)	USEPA, July 1996	(1)	USEPA, July 1996	
	PEF	Particulate emission factor	m^3/kg	1.24E+09	FDEP. August 1999	1.24E+09	FDEP. August 1999	
	IR	Inhalation Rate	m^3/hour	2.5	USEPA, December 2002	1.5	USEPA, August 1997	
	ET	Exposure Time	hours/day	8	USEPA, December 2002	8	USEPA, December 2002	
	EF	Exposure Frequency	days/year	30	ABB-ES, January 1998	30	ABB-ES, January 1998	
	ED	Exposure Duration	years	25	USEPA, May 1993	9	USEPA, May 1993	
	BW	Body Weight	kg	70	USEPA, December 1989	70	USEPA, December 1989	
	AT-C	Averaging Time (Cancer)	days	25550	USEPA, December 1989	25550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9125	USEPA, December 1989	3285	USEPA, December 1989	

Notes:

1 - Calculated according to USEPA Soil Screening Guidance, December 2002.

TABLE 2-8

DAILY INTAKE VALUES FOR CALCULATION OF
EXPOSURE OF ADULT TRESPASSERS / RECREATIONAL USERS BY INHALATION OF PARTICULATES/VAPORS FROM SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air
Exposure Point: Entire Site
Receptor Population: Trespasser/Recreational User
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation
Inhalation	CS	Chemical concentration in soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Intake (mg/kg/day) = $\frac{CS \times IR \times \left[\frac{1}{VF} + \frac{1}{PEF}\right] \times ET \times EF \times ED}{BW \times AT}$
	VF	Volatilization factor - Chemical Specific	m^3/kg	(1)	USEPA, July 1996	(1)	USEPA, July 1996	
	PEF	Particulate emission factor	m^3/kg	1.24E+09	FDEP. August 1999	1.24E+09	FDEP. August 1999	
	IR	Inhalation Rate	m^3/hour	1.6	USEPA, August 1997	1.0	USEPA, August 1997	
	ET	Exposure Time	hours/day	4	ABB-ES, January 1998	4	ABB-ES, January 1998	
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	ED	Exposure Duration	years	20	ABB-ES, January 1998	20	ABB-ES, January 1998	
	BW	Body Weight	kg	70	USEPA, May 1993	70	USEPA, May 1993	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	7,300	USEPA, December 1989	7,300	USEPA, December 1989	

Notes:

1 - Calculated according to USEPA Soil Screening Guidance, December 2002.

TABLE 2-9

DAILY INTAKE VALUES FOR CALCULATION OF
EXPOSURE OF ADOLESCENT TRESPASSERS / RECREATIONAL USERS BY INHALATION OF PARTICULATES/VAPORS FROM SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Air
Exposure Point: Entire Site
Receptor Population: Trespasser/Recreational User
Receptor Age: Child (7 to 16 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation
Inhalation	CS	Chemical concentration in soil	mg/kg	95% UCL or Max	USEPA, May 1993	95% UCL or Max	USEPA, May 1993	Intake (mg/kg/day) = $\frac{CS \times IR \times \left[\frac{1}{VF} + \frac{1}{PEF}\right] \times ET \times EF \times ED}{BW \times AT}$
	VF	Volatilization factor - Chemical Specific	m^3/kg	(1)	USEPA, July 1996	(1)	USEPA, July 1996	
	PEF	Particulate emission factor	m^3/kg	1.24E+09	FDEP. August 1999	1.24E+09	FDEP. August 1999	
	IR	Inhalation Rate	m^3/hour	1.2	USEPA, August 1997	1.0	USEPA, August 1997	
	ET	Exposure Time	hours/day	4	ABB-ES, January 1998	4	ABB-ES, January 1998	
	EF	Exposure Frequency	days/year	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	ED	Exposure Duration	years	10	ABB-ES, January 1998	10	ABB-ES, January 1998	
	BW	Body Weight	kg	45	ABB-ES, January 1998	45	ABB-ES, January 1998	
	AT-C	Averaging Time (Cancer)	days	25,550	USEPA, December 1989	25,550	USEPA, December 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	USEPA, December 1989	3,650	USEPA, December 1989	

Notes:

1 - Calculated according to USEPA Soil Screening Guidance, December 2002.

TABLE 2-10

**TOXICITY EQUIVALENCY FACTORS FOR
CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

Compound	Toxicity Equivalency Factor
Benzo(a)pyrene	1.0
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.001
Dibenzo(a,h)anthracene	1.0
Indeno(l,2,3c,d)pyrene	0.1

Source: USEPA Region 4, May 2000.

3.0 SITE 9, WASTE FUEL DISPOSAL PIT

This section presents the results of the HHRA conducted for surface soil samples collected at Site 9. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

3.1 SITE DESCRIPTION

Site 9 is located along the eastern facility boundary near the South Air Field and is approximately 2 acres in size (see Figure 1-2 of the 1999 RI report). Historically, Site 9 was used for the disposal of an undetermined amount of waste aviation fuel. During the 1950s and 1960s, waste fuel containing tetraethyl lead was reportedly disposed in the northern part of Site 9. Reportedly, a tanker truck was used to transport waste fuel to an unlined disposal pit into which it was drained. Based on anecdotal information, approximately 200 to 300 gallons of waste fuel were disposed at the site per trip. At the approximate location of the suspected disposal pit, an ephemeral pond occurs during heavy rain periods.

The approximate location of Site 9 is shown on Figure 1-2 of the 1999 RI report. There are currently no buildings at Site 9. No permanent surface water sources exist at Site 9. In the early 1990s, Site 9 consisted of overgrown shrubs and planted pine trees, approximately 25 to 40 feet in height. Construction debris was present on the ground surface at the site. Current conditions reflect the emplacement of a 24-inch permeable soil layer and native grass cover over the surface of the site (Bechtel, February 2000). Site 9 is vacant, unused land at this time.

3.2 SUMMARY OF PHASE IIB FIELD INVESTIGATION FOR SOILS

The soil dataset for Site 9 consists of surface soil samples collected from five locations (09SO01 through 09SO05) during the 1995 Phase IIB field investigation. Prior to the 1995 field activities, sampling at Site 9 had been biased based on the results of a geophysical survey (Geraghty & Miller, 1986); therefore, random sampling techniques were employed during the Phase IIB sampling event to more appropriately support ERA and HHRA evaluations. The vertical extent of sampling at Site 9 was limited to surface soil (defined as 0 to 1 foot bgs). Subsurface soil samples were not collected at Site 9.

The Phase IIB surface soil samples were analyzed for Target Compound List (TCL) VOCs, semivolatile organic compounds (SVOCs), pesticides and PCBs, Target Analyte List (TAL) inorganics and Total

Recoverable Petroleum Hydrocarbon (TRPH). Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface soil samples are presented in Table 3-1. The complete analytical database is included on the compact disc (CD) submitted with this report; a printout of the analytical database in provided in Appendix A.

Surface soil sample locations are presented on Figure 3-2 of the 1999 RI report.

3.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2.0 were used to select COPCs for Site 9. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct screening criteria) and the rationale for COPC selection are provided in the following paragraphs. No subsurface soil samples were collected at Site 9; therefore, COPCs were only identified for surface soil.

Two SVOCs and 18 inorganics were detected in five surface soil samples collected at Site 9. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 3-1. Also presented in Table 3-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A.

Although concentrations of aluminum, arsenic, iron, and vanadium in surface soil exceeded the screening criteria (Table 3-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 9. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 9 surface soils.

Antimony was the only chemical detected at concentrations in excess of the direct contact, risk based COPC screening levels and background concentrations and consequently was retained as a COPC for surface soil at Site 9. Antimony was only detected in one of five surface soil samples. The detected concentration exceeded the simple apportioned PRG but was less than the non-apportioned PRG and simple apportioned and non-apportioned SCTLs.

3.4 RISK CHARACTERIZATION

This section provides a characterization of the human health risks associated with the potential exposures to chemicals in surface soils at Site 9. As discussed in Section 2.0, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and proposed FDEP risk assessment guidance. The details of the exposure assessment methodology, including the selection of relevant receptors and exposure pathways, were presented in Section 2.0. The results of the risk characterization are discussed below.

3.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 9 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs (i.e., antimony). Potential risks and HIs were calculated using the methodology presented in Section 2.0 and are summarized in Table 3-2. The results are discussed below. Chemical-specific risks for Site 9 are presented in Appendix B. No subsurface soil samples were collected at Site 9; therefore, risk estimates were only calculated for exposures to surface soil. No COCs were identified for surface soil based on the risk characterization conducted per USEPA guidelines.

Non-carcinogenic Risk

Cumulative HIs for exposures to surface soil were less than 1 for all receptors evaluated, indicating that adverse non carcinogenic effects are not anticipated under the conditions defined in the exposure assessment. As indicated above, antimony was the only chemical selected as a COPC; thus, the HIs presented in Table 3-2 are those calculated for antimony as detailed in Appendix B.

Carcinogenic Risk

No CSFs are available for the antimony; therefore, ILCRs were not calculated.

3.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 9 conducted using guidelines presented in proposed Florida Rule 62-780 FAC (see Section 2.0). No subsurface soil samples were collected at Site 9; therefore, only surface soil sampling results were evaluated in the analysis. The results are discussed below.

Level 1 Evaluation (Residential)

Table 3-3 presents a comparison of the maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs.

None of the chemicals detected in the surface soils for Site 9 were selected as COCs using Florida Level 1 direct contact SCTLs. Only the maximum concentrations and EPCs calculated for arsenic, iron, and vanadium exceeded the Level 1 criteria. Only the maximum concentrations and EPCs for arsenic and vanadium exceeded three times the residential SCTLs. However, please see the preceding discussion (Section 3.3) regarding arsenic, iron, and vanadium. Arsenic, iron, and vanadium were not retained as COCs.

As shown in Table 3-4 the concentrations of all organics in surface soil at Site 9 were significantly less than the C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial) and 3 (Recreational)

No COCs were identified based on the Level 1 evaluation of surface soil; consequently, Level 2 and Level 3 evaluations were not required for the Site 9 surface soils.

3.5 SITE SPECIFIC UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA presented in this section, including a discussion of how these uncertainties may affect the interpretation of the final risk estimates, is provided in this section.

3.5.1 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for Site 9 were selected, in part, using available background concentrations for soil. Aluminum, arsenic, iron, and vanadium were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)	FDEP SCTL (mg/kg)
Aluminum	33,100	72,000
Arsenic	10.1	0.8
Iron	29,800	23,000
Vanadium	76.7	15

The SCTLs presented for aluminum, iron, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum is less than the one-half of the SCTL. The maximum detected concentration of iron is 1.3 times greater than the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTLs is not a definitive indication of the potential for adverse non-cancer health effects. The maximum detected concentration of vanadium is approximately 5 times greater than its SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the "pica" soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the value is the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentration of arsenic exceeds the 1×10^{-6} and 1×10^{-5} cancer risk levels, but not the 1×10^{-4} risk level.

3.5.2 Subsurface Soil Characterization

A risk characterization is not presented for Site 9 subsurface soils because no subsurface soil samples were collected during the field investigations.

3.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in five surface soil samples collected at Site 9. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. Antimony was the only chemical selected as a COPC. No chemicals were selected as potential COCs for further evaluation in a Feasibility Study.

A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of the site in 1999 (Bechtel, February 2000). Consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying this permeable cap.

This assessment was limited to an evaluation of analytical data for surface soils; subsurface soil samples have not been collected at Site 9.

TABLE 3-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background? (4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
Semivolatile Organics (mg/kg)																			
120-82-1	1,2,4-TRICHLOROBENZENE	1/5	0.11 J	0.11 J	0.36 - 0.47	09S00501	0.11	NA (13)	650	N	65	560	N	660	Adrenals, Body Weight	190	2.0E-04	No	BSL
106-46-7	1,4-DICHLOROBENZENE	1/5	0.12	0.12	0.36 - 0.47	09S00501	0.12	NA	3.4	C	0.85	6	C	6.4	---	2	2.0E-02	No	BSL
Inorganics (mg/kg)																			
7429-90-5	ALUMINUM	4/5	17500	33100	40	09S00301-D	33100	no	76000	N	**7600**	72000	N	80000	Body Weight	**24000**	4.6E-01	No	BKG
7440-36-0	**ANTIMONY**	1/5	8.3 J	8.3 J	12	09S00201	8.3	yes	31	N	**3.1**	26	N	27	Blood, Mortality	8.7	3.2E-01	**Yes**	**ASL**
7440-38-2	ARSENIC	5/5	2.8	10.1	---	09S00101, 09S00401	10.1	no	0.39	C	**0.0975**	0.8	C	2.1	---	**0.27**	**1.3E+01**	No	BKG
7440-39-3	BARIUM	4/5	5.5 J	21.7 J	40	09S00301-D	21.7	no	5400	N	540	110	N	120	Cardiovascular	110	2.0E-01	No	BSL,BKG
7440-41-7	BERYLLIUM	4/5	0.08 J	0.22 J	1	09S00301-D	0.22	NE (14)	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.8E-03	No	BSL
7440-70-2	CALCIUM	1/5	384 J	384 J	1000	09S00301-D	384	NE	---		---	---		---	---	---		No	NUT
7440-47-3	CHROMIUM	4/5	14.9	46.2	2	09S00101	46.2	yes	210	C	52.5	210	C	210	---	70	2.2E-01	No	BSL
7440-48-4	COBALT	1/5	0.52 J	0.55 J	10	09S00301-D	0.55	NE	900	C	225	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	1570	1.2E-04	No	BSL
7440-50-8	COPPER	4/5	4.5 J	9	5	09S00301-D	9	NE	3100	N	310	110	N	150	Gastrointestinal	110	8.2E-02	No	BSL
7439-89-6	IRON	4/5	12300	29800	20	09S00101	29800	no	23000	N	**2300**	23000	N	53000	Blood, Gastrointestinal	**7670**	1.3E+00	No	BKG
7439-92-1	LEAD	5/5	3.1	12.3	---	09S00401	12.3	NE	400		400	400		400	---	400	3.1E-02	No	BSL
7439-95-4	MAGNESIUM	4/5	73.3 J	227 J	1000	09S00301-D	227	NE	---		---	---		---	---	---		No	NUT
7439-96-5	MANGANESE	4/5	10.1 J	52.9 J	3	09S00301-D	52.9	no	1800	N	180	1600	N	3500	Neurological	533	3.3E-02	No	BSL,BKG
7439-97-6	MERCURY	4/5	0.01 J	0.03 J	0.1	09S00401	0.03	NE	23	N	2.3	3.4	N	3	Neurological	1.1	8.8E-03	No	BSL
7440-02-0	NICKEL	3/5	2.9 J	6.1 J	8	09S00301-D	6.1	NE	1600	N	160	110	N	340	Body Weight	110	5.5E-02	No	BSL
7440-09-7	POTASSIUM	1/5	212 J	212 J	1000	09S00301-D	212	NE	---		---	---		---	---	---		No	NUT
7440-62-2	VANADIUM	4/5	32.2	76.7	10	09S00101	76.7	no	550	N	**55**	15	N	67	NOEL	**15**	**5.1E+00**	No	BKG
7440-66-6	ZINC	3/5	3.8 J	14.4	4	09S00301-D	14.4	NE	23000	N	2300	23000	N	26000	Blood	7670	6.3E-04	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 4 chemicals detected in surface soil at Site 9. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 4. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of chemicals impacting the same target organ for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 3 carcinogens were detected in surface soil at Site 9. Therefore, the simple apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 3. For noncarcinogens, neurological effects were identified as the target organ for 3 chemicals. Therefore, the simple apportioned SCTLs for these chemicals are the non-apportioned values divided by 3. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on **acute** toxicity considerations. Therefore, simple apportioned SCTLs were not calculated for these chemicals because SCTLs for most chemicals are based on **chronic** effects.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL, and, for metals, if site concentrations exceed background levels.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:
09S00101
09S00201
09S00301
09S00301-D
09S00401
09S00501

TABLE 3-2

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 9, WASTE FUEL DISPOSAL PIT
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	NTX	- -	- -	- -	0.3	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Industrial Workers	Surface Soil	NTX	- -	- -	- -	0.03	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Construction Workers	Surface Soil	NTX	- -	- -	- -	0.07	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Maintenance Workers	Surface Soil	NTX	- -	- -	- -	0.001	- -
Adolescent Recreational Users	Surface Soil	NTX	- -	- -	- -	0.006	- -
Adult Recreational Users	Surface Soil	NTX	- -	- -	- -	0.004	- -
Lifelong Recreational Users	Surface Soil	NTX	- -	- -	- -	NA	- -

Notes:
NTX - Not applicable. There are no cancer slope factors (CSF) available for chemicals retained as COPCs.
NE - Not evaluated. No subsurface soil samples were collected.
NA - Not applicable.
HI - Hazard Index.

TABLE 3-3

FLORIDA LEVEL TIER 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
Semivolatile Organics (mg/kg)								
120-82-1	1,2,4-TRICHLOROBENZENE	0.11 J	0.11	560 N	2.0E-04	NA(6)	No	maximum < SCTL
106-46-7	1,4-DICHLOROBENZENE	0.12	0.12	6 C	2.0E-02	NA	No	maximum < SCTL
Inorganics (mg/kg)								
7429-90-5	ALUMINUM	33100	33100	72000 N	4.6E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	8.3 J	8.3	26 N	3.2E-01	NE(7)	No	maximum < SCTL
7440-38-2	ARSENIC	10.1	10.1	0.8 C	1.3E+01	no	No	(8)
7440-39-3	BARIUM	21.7 J	21.7	110 N	2.0E-01	no	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.22 J	0.22	120 N	1.8E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	384 J	384	NA	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	46.2	46.2	210 C	2.2E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	0.55 J	0.55	4700 N	1.2E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	9	9	110 N	8.2E-02	NE	No	maximum < SCTL
7439-89-6	IRON	29800	29800	23000 N	1.3E+00	no	No	(8)
7439-92-1	LEAD	12.3	7.1	400	---	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	227 J	227	NA	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	52.9 J	52.9	1600 N	3.3E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.03 J	0.03	3.4 N	8.8E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	6.1 J	6.1	110 N	5.5E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	212 J	212	NA	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	76.7	76.7	15 N	5.1E+00	no	No	(8)
7440-66-6	ZINC	14.4	14.4	23000 N	6.3E-04	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 3-3

FLORIDA LEVEL TIER 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 9 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
09S00101
09S00101
09S00201
09S00201
09S00301
09S00301-AVG

Definitions:
C = Carcinogen.
COC = Chemical of concern.
J = Estimated value.
N = Noncarcinogen.

TABLE 3-4

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background? (3)	Soil Saturation Limit, Csat (4)
Semivolatile Organics (mg/kg)							
120-82-1	1,2,4-TRICHLOROBENZENE	1/5	0.11 J	0.11	09S00501	NA (5)	370
106-46-7	1,4-DICHLOROBENZENE	1/5	0.12	0.12	09S00501	NA	280

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

09S00101	09S00301-D
09S00101	09S00401
09S00201	09S00401
09S00201	09S00501
09S00301	09S00501
09S00301-AVG	

4.0 SITE 10, SOUTHEAST OPEN DISPOSAL AREA A

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 10. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

4.1 SITE DESCRIPTION

Site 10 is adjacent to Site 9 at the eastern boundary of the facility and is approximately 4 acres in size. From 1965 to 1973, this site was used for the disposal of inert wastes such as construction debris, trees, brush, metal cans, and similar materials not suitable for sanitary landfill disposal. Transformer oil and empty pesticide/herbicide containers were also reportedly disposed at the site. Historically, access to the site was uncontrolled, and other potentially hazardous wastes also may have been disposed at the site. The precise locations of the disposal areas at Site 10 are unknown; however, the approximate location of the disposal areas were determined based on a geophysical survey conducted during the RI Phase IIA fieldwork (ABB-ES, 1992).

The approximate location of Site 10 is shown on Figure 1-2 of the 1999 RI report. There are currently no buildings at Site 10. No permanent surface water sources exist at Site 10. In the early 1990s, the site consisted of overgrown shrubs and planted pine trees, approximately 25 to 40 feet in height. Current conditions reflect the emplacement of a 24-inch permeable soil layer and native grass cover over the surface of the site (Bechtel, February 2000). Site 10 is vacant, unused land at this time.

4.2 SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATIONS FOR SOILS

The surface soil dataset for Site 10 consists of surface soil samples collected from five locations (10-SL-01 through 10-SL-05) during the 1992 Phase IIA field investigation and from six locations (10SO01 through 10SO06) during the 1995/1996 Phase IIB field investigation. Prior sampling methods at Site 10 were biased based on the results of the aforementioned geophysical survey; therefore, random sampling techniques were employed during these investigations to more appropriately support ERA and HHRA evaluations. The Phase IIA and IIB surface soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL metals, cyanide, and TRPH.

For the purposes of characterizing waste materials, test pits were excavated at locations where a geophysical anomaly indicated the potential location of buried materials. The subsurface soil dataset for Site 10 consists of subsurface soil samples collected from three test pit locations (Test Pit TP-10-02, sample 10-SS0201; Test Pit TP-10-03, sample 10-SS0302; and Test Pit TP-10-05, sample 10-SS0503) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from depth intervals of 4 to 5 feet (Test Pit TP-10-02), 6 to 8 feet (Test Pit TP-10-03), and 8 to 9.5 feet (Test Pit TP-10-05) and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 4-1 and 4-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database in provided in Appendix A.

Surface and subsurface soil sample locations are presented on Figures 3-2 of the 1999 RI report.

4.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 10. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact screening criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 4-1 and 4-2, respectively.

4.3.1 Surface Soil

Two VOCs, 18 SVOCs, 10 pesticides/PCBs, 21 inorganics, TRPH, and cyanide were detected in 11 surface soil samples collected at Site 10. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 4-1. Also presented in Table 4-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in surface soils at maximum concentrations exceeding the direct contact, risk based COPC screening levels and background, and were retained as COPCs for surface soil at Site 10:

- SVOCs [bis(2-ethylhexyl) phthalate and carcinogenic PAHs (cPAHs)]
- Pesticides/PCBs (Aroclor-1254, Aroclor-1260, and dieldrin)
- Inorganics (barium and chromium)
- TPRH

Aroclor-1260 was detected in only two samples, and dieldrin was only detected in one sample. The maximum concentration of bis(2-ethylhexyl) phthalate exceeded the simple apportioned PRG but was less than the non-apportioned PRG and simple apportioned and non-apportioned SCTLs. The maximum concentration of cPAHs exceeded the simple apportioned and non-apportioned PRGs and SCTLs. The maximum concentrations of Aroclor-1260, dieldrin, and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. The maximum concentration of Aroclor-1254 exceeded the simple apportioned and non-apportioned PRGs and the simple apportioned SCTL but was less than the non-apportioned SCTL. The maximum concentration of barium exceeded the simple apportioned and non-apportioned SCTLs but was less than the simple apportioned and non-apportioned PRGs. The TRPH and barium concentrations exceeding the relevant SCTLs were reported for samples also demonstrating cPAH concentrations exceeding the SCTLs.

Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria (Table 4-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 10. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 10 surface soils.

4.3.2 Subsurface Soil

Five VOCs, eight SVOCs, five pesticides/PCBs, 22 inorganics, and cyanide were detected in three subsurface soil samples collected at Site 10. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 4-2. Also presented in Table 4-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in subsurface soils at maximum concentrations exceeding the direct contact, risk based COPC screening levels and background concentrations, and were retained as COPCs for subsurface soil at Site 10:

- Pesticides (aldrin and dieldrin)
- Inorganics (antimony and chromium)

Maximum concentrations of aldrin and dieldrin exceeded the simple apportioned PRGs but were less than the simple apportioned and non-apportioned SCTLs and the non-apportioned PRGs. Maximum concentrations of antimony and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs.

Although concentrations of aluminum, arsenic, iron, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 10. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 10 subsurface soils.

4.4 RISK CHARACTERIZATION

This section provides a characterization of the human health risks associated with the potential exposures to chemicals in surface and subsurface soils at Site 10. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

4.4.1 Risk Characterization Using EPA Guidelines

This section contains a summary of the results of the risk characterization for Site 10 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 4.3. Potential cancer risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 4-3. The results are discussed below. Chemical-specific risks for Site 10 are presented in Appendix B.

Non-Carcinogenic Risk

Cumulative HIs estimated for exposures to surface and subsurface soil by all receptors were less than or equal to 1, indicating that adverse non carcinogenic effects are not anticipated for these receptors under the conditions established in the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to surface and subsurface soil were within USEPA's target risk range of 10^{-4} to 10^{-6} for all receptors. However, ILCRs exceeded the State of Florida's target risk level of 1 x 10^{-6} for exposures to surface soil by residents, industrial workers, construction workers, adolescent recreational users, and lifelong recreational users, and for exposures to subsurface soil by construction workers. Chemical-specific ILCRs for the cPAHs exceeded 1 x 10^{-6} for exposures to surface soil for all receptors except the maintenance worker, and the chemical-specific ILCR for chromium exceeded 1 x 10^{-6} for exposures to subsurface soil by the construction worker. The EPCs for the cPAHs in surface soil and chromium in subsurface soil were 2.3 mg/kg and 207 mg/kg, respectively.

4.4.2 <u>Risk Characterization Using State of Florida Guidelines</u>

This section contains a summary of the results of the risk characterization for Site 10 conducted using guidelines presented in proposed Florida Rule 62-780 FAC as discussed in Section 2.0. The results are summarized in Tables 4-4 through 4-9 and are discussed below.

4.4.2.1 Surface Soil

<u>Level 1 Evaluation (Residential)</u>

Table 4-4 presents a comparison of the maximum detected concentrations and the EPCs for surface soil to the FDEP residential SCTLs. The following chemicals were identified as exceeding the Level 1 SCTLs and were retained as potential COCs for residential exposures to surface soil at Site 10:

- SVOCs [cPAHs (expressed as benzo(a)pyrene equivalents)]
- Inorganics (barium)
- TRPH

The maximum detected concentrations of the cPAHs and barium also exceeded three times the residential SCTLs.

The maximum detected concentrations and/or EPCs for arsenic, iron, and vanadium exceeded the Level 1 criteria. However, please see the preceding discussion (Section 4.3) regarding these metals. Arsenic, iron, and vanadium were not retained as potential COCs for residential exposures to surface soil at the Site 10.

As shown in Table 4-5 the concentrations of all organics in surface soil were significantly less than the C_{sat} concentrations, indicating that free product is not present in surface soil.

Level 2 (Industrial)

The results of the Level 1 evaluation identified three potential COCs; therefore, a Level 2 evaluation was conducted. A comparison of the maximum concentrations and EPCs for surface soil to the FDEP industrial SCTLs is presented in Table 4-6. The following chemicals were identified as exceeding the Level 2 SCTLs, and were retained as potential COCs for industrial exposures to surface soil at Site 10:

- SVOCs [cPAHs (expressed as benzo(a)pyrene equivalents)

The maximum detected concentration and EPC for arsenic also exceeded the Level 2 criteria. However, please see the preceding discussion (Section 4.3) regarding arsenic. Arsenic was not retained as a COC for industrial exposures to surface soil at the Site 10.

Level 3 (Recreational)

The results of the Level 2 evaluation identified one potential COC (cPAHs); therefore, a Level 3 evaluation was conducted assuming a future recreational land use scenario for Site 10. Alternative SCTLs for recreational exposures were derived following the methodology presented in Appendix B. A comparison of the maximum detected concentrations and EPCs for surface soil to the alternative CTLs is presented in Table 4-7. The maximum concentration and EPC for the cPAHs exceeded the Level 3 alternative SCTLs. Consequently, the cPAHs were retained as potential COCs for the Site 10 surface soil.

The EPC for arsenic also exceeded the Level 3 criteria. However, please see the preceding discussion (Section 4.3) regarding arsenic. Arsenic was not retained as a COC for recreational exposures to surface soil at the Site 10.

4.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 4-8 presents a comparison of the maximum concentrations and EPCs for subsurface soil to FDEP residential SCTLs. No chemicals were detected at maximum concentrations exceeding SCTLs for residential land use. Consequently, no COCs were identified for the subsurface soils at Site 10.

The EPCs for arsenic, iron, and vanadium exceeded the Level 1 criteria. In addition, the maximum detected concentrations of arsenic and vanadium exceeded three times the residential SCTLs. However, please see the preceding discussion (Section 4.3) regarding these metals. Arsenic, iron, and vanadium were not retained as COCs for residential exposures to subsurface soil at the Site 10.

The maximum detected concentrations of all organics were less than three times the residential SCTLs. A shown in Table 4-9, the concentrations of all organics in subsurface soil were also significantly less than the C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 (Industrial) and Level 3 (Recreational)

No COCs were identified in the Level 1 evaluation; consequently, Level 2 and 3 evaluations were not required.

4.5 SITE-SPECIFIC UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided below.

4.5.1 Uncertainty Associated with a Construction Worker Exposed to Chromium in Subsurface Soil

The ILCR for construction workers for exposure to chromium in subsurface soil was 1×10^{-5}, which exceeds the State of Florida's target risk level of 1×10^{-6}. Because there were less than 10 subsurface soil samples, the maximum detected concentration of chromium (207 mg/kg) was used as the EPC. Use of the maximum concentration tends to overestimate potential risks because construction workers are assumed to be exposed continuously to the maximum concentration for the entire exposure period. The second highest concentration reported for chromium in the subsurface soils was 13.6 mg/kg, which corresponds to a ILCR of 6×10^{-7}. In addition, the risk estimates for the construction worker assume the worker is being exposed to fugitive dust emissions generated by vehicular traffic during a construction project lasting for 1 year. Although a construction project lasting 1 year is possible at Site 10, it is very unlikely a construction worker would be exposed to high levels of fugitive dust from subsurface soil for the entire duration of the construction project. Consequently, there is uncertainty associated the evaluation of construction workers exposed to chromium in the subsurface soil at Site 10. It should be noted that the maximum chromium concentration in the subsurface soils does not exceed the FDEP SCTL for residential land use.

4.5.2 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 10 were selected using available background concentrations for soil. Aluminum, arsenic, iron, manganese, and vanadium in surface soil and aluminum, arsenic, iron, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	37,000	12,700	72,000
Arsenic	8.8	3.7	0.8
Iron	23,800	44,600	23,000
Manganese	389	Not Applicable	1,600
Vanadium	63.4	104	15

The SCTLs presented for aluminum, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-half of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-sixth of the SCTL. The maximum detected concentration of iron in surface soil is marginally greater than the SCTL, and the maximum detected concentration in subsurface soil is approximately twice the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL for aluminum or iron is not a definitive indication of the potential for adverse non-cancer health effects. The maximum detected concentration of manganese in surface soil is approximately one-fourth of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately four times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately seven times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentration of arsenic in surface and subsurface soil exceeds the 1×10^{-6} and 1×10^{-5} cancer risk levels but not the 1×10^{-4} risk level.

4.5.3 Limited Subsurface Soil Data

Three subsurface soil samples only were collected during the field investigation at Site 10. However, test pits were excavated at locations where geophysical anomalies identified the potential location of buried materials.

4.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in 11 surface soil and three subsurface soil samples collected at Site 10. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation route of exposures. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at the Site 10. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

A 24-inch permeable soil layer and native grass cover was emplaced over the surface soil of Site 10 in 1999 (Bechtel, February 2000); consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying the permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction or excavation activities bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Several organics (primarily cPAHs, dieldrin, and two Aroclors) and two inorganics (barium and chromium) were selected as COPCs for surface soil and were evaluated in the quantitative HHRA conducted per USEPA guidelines. Two pesticides (aldrin and dieldrin) and two inorganics (antimony and chromium) were selected as COPCs for subsurface soil and were also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., the HIs) did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although cancer risk estimates developed for four of the five receptors evaluated (the hypothetical future resident, the typical industrial worker, the construction worker, and the recreational user) exceed the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the cPAHs; chemical-specific risk estimates for all other COPCs approximate or are less than 1 x 10^{-6}. The only risk driver for subsurface soils was chromium (construction worker only); chemical-specific risk estimates for all other COPCs were less than 1 x 10^{-7}. As discussed in the preceding uncertainty section (Section 4.5), the construction worker was evaluated in a very conservative manner; risk estimates for this receptor are likely to be overestimated.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenario, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of EPCs to these SCTLs:

Residential SCTLs	**Industrial SCTLs**	**Recreational SCTLs**
cPAHs	cPAHs	cPAHs
Barium		
TRPH		

Over 90 percent of the estimated cancer risk is attributable to cPAHs. The total cancer risk estimates for the industrial and recreational land use scenarios would not exceed 1 x 10^{-6} if cPAHs were not detected or were only detected at concentrations approximately equal to the SCTLs. The TRPH and barium concentrations exceeding the relevant SCTLs were reported for samples also demonstrating cPAH concentrations exceeding the SCTLs.

TABLE 4-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
591-78-6	2-HEXANONE	1/11	0.004 J	0.004 J	0.011 - 0.012	10S00201-D	0.004	NA (13)	---	---	5.1 N	24	None specified	1	7.8E-04	No	BSL
1330-20-7	TOTAL XYLENES	1/11	0.001 J	0.001 J	0.005 - 0.012	10-SL-04	0.001	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	840	1.7E-07	No	BSL
	Semivolatile Organics (mg/kg)																
83-32-9	ACENAPHTHENE	2/11	0.04 J	0.11 J	0.35 - 1.6	10S00301	0.11	NA	3700 N	370	1900 N	2400	Liver	480	5.8E-05	No	BSL
120-12-7	ANTHRACENE	3/11	0.054 J	0.27 J	0.35 - 1.6	10S00101-D	0.27	NA	22000 N	2200	18000 N	21000	None specified	3600	1.5E-05	No	BSL
191-24-2	BENZO(G,H,I)PERYLENE	2/11	0.18 J	3.8	0.35 - 0.38	10S00401	3.8	NA	2300 N	230	2300 N	2500	Neurological	330	1.7E-03	No	BSL
117-81-7	**BIS(2-ETHYLHEXYL)PHTHALATE**	7/11	0.057 J	3.3	0.36 - 1.6	10S00201	3.3	NA	35 C	**2.3**	76 C	72	---	5	4.3E-02	**Yes**	**ASL**
85-68-7	BUTYL BENZYL PHTHALATE	4/11	0.04 J	0.085 J	0.35 - 1.6	10-SL-02	0.085	NA	12000 N	1200	15000 N	17000	Liver	3800	5.7E-06	No	BSL
132-64-9	DIBENZOFURAN	1/11	0.052 J	0.052 J	0.35 - 1.6	10S00301	0.052	NA	290 N	29	280 N	320	None specified	56	1.9E-04	No	BSL
84-66-2	DIETHYL PHTHALATE	1/11	0.096 J	0.096 J	0.35 - 1.6	10-SL-03	0.096	NA	49000 N	4900	54000 N	61000	Body Weight	11000	1.8E-06	No	BSL
206-44-0	FLUORANTHENE	8/11	0.059 J	2.3	0.37 - 0.38	10S00101-D	2.3	NA	2300 N	230	2900 N	3200	Blood, Kidney , Liver	730	7.9E-04	No	BSL
86-73-7	FLUORENE	1/11	0.12 J	0.12 J	0.35 - 1.6	10S00301	0.12	NA	2700 N	270	2200 N	2600	Blood	550	5.5E-05	No	BSL
85-01-8	PHENANTHRENE	6/11	0.036 J	1.2	0.370 - 1.6	10S00101-D	1.2	NA	2300 N	230	2000 N	2200	Kidney	500	6.0E-04	No	BSL
129-00-0	PYRENE	9/11	0.045 J	1.8	0.37 - 0.38	10S00401	1.8	NA	2300 N	230	2200 N	2400	Kidney	550	8.2E-04	No	BSL
50-32-8	**CARCINOGENIC PAHS**	9/11	0.004	4.2	---	10S00401	4.2	NA	0.062 C	**0.004**	0.1 C	0.1	---	**0.007**	**4.2E+01**	**Yes**	**ASL**
	Pesticides PCBs (mg/kg)																
72-54-8	4,4'-DDD	1/11	0.0044 J	0.0044 J	0.0036 - 0.17	10S00301	0.0044	NA	2.4 C	0.16	4.6 C	4.2	---	0.3	9.6E-04	No	BSL
72-55-9	4,4'-DDE	1/11	0.037	0.037	0.0036 - 0.17	10S00401	0.037	NA	1.7 C	0.11	3.3 C	2.9	---	0.2	1.1E-02	No	BSL
50-29-3	4,4'-DDT	7/11	0.0021	0.035	0.0038 - 0.019	10S00401	0.035	NA	1.7 C	0.11	3.3 C	2.9	---	0.2	1.1E-02	No	BSL
5103-71-9	ALPHA-CHLORDANE	2/11	0.0011 J	0.0052 J	0.0019 - 0.86	10S00401	0.0052	NA	1.6 C	0.11	3.1 C	---	---	0.2	1.7E-03	No	BSL
11097-69-1	**AROCLOR-1254**	5/11	0.051 J	0.39	0.036 - 0.2	10S00201-D	0.39	NA	0.22 C	**0.015**	0.5 C	0.5	---	**0.036**	7.8E-01	**Yes**	**ASL**
11096-82-5	**AROCLOR-1260**	2/11	0.049 J	0.06 J	0.036 - 1.7	10-SL-02	0.06	NA	0.22 C	**0.015**	0.5 C	0.5	---	**0.036**	1.2E-01	**Yes**	**ASL**
60-57-1	**DIELDRIN**	1/11	0.019	0.019	0.0036 - 0.17	10S00401	0.019	NA	0.03 C	**0.002**	0.07 C	0.06	---	**0.005**	2.7E-01	**Yes**	**ASL**
5103-74-2	GAMMA-CHLORDANE	1/11	0.0064	0.0064	0.0019 - 0.86	10S00601	0.0064	NA	1.6 C	0.11	3.1 C	---	---	0.2	2.1E-03	No	BSL
76-44-8	HEPTACHLOR	1/11	0.0052	0.0052	0.0019 - 0.086	10S00601	0.0052	NA	0.11 C	0.007	0.2 C	0.2	---	0.01	2.6E-02	No	BSL
1024-57-3	HEPTACHLOR EPOXIDE	1/11	0.0024	0.0024	0.0019 - 0.086	10S00601	0.0024	NA	0.053 C	0.004	0.1 C	0.1	---	0.007	2.4E-02	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	11/11	5890	37000	---	10-SL-04	37000	no	76000 N	**7600**	72000 N	80000	Body Weight	**14400**	5.1E-01	No	BKG
7440-38-2	ARSENIC	11/11	2.4	8.8	---	10-SL-04	8.8	no	0.39 C	**0.026**	0.8 C	2.1	---	**0.057**	**1.1E+01**	No	BKG
7440-39-3	**BARIUM**	11/11	7.5 J	361 J	40	10S00101	361	yes	5400 N	540	110 N	120	Cardiovascular	**110**	**3.3E+00**	**Yes**	**ASL**
7440-41-7	BERYLLIUM	9/11	0.06 J	0.26 J	0.09 - 1	10S00401	0.26	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	2.2E-03	No	BSL
7440-43-9	CADMIUM	7/11	0.5 J	2.4	0.9 - 1	10-SL-02	2.4	NE	37 N	3.7	75 N	82	Kidney	75	3.2E-02	No	BSL
7440-70-2	CALCIUM	11/11	157 J	23200	---	10S00101	23200	NE	---	---	---	---	---	---		No	NUT
7440-47-3	**CHROMIUM**	11/11	10.1	31.9	---	10-SL-04	31.9	yes	210 C	**14**	210 C	210	---	**15**	1.5E-01	**Yes**	**ASL**
7440-48-4	COBALT	10/11	0.79 J	2.4 J	10	10-SL-02	2.4	NE	900 C	60	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	671	5.1E-04	No	BSL
7440-50-8	COPPER	10/11	5.2 J	24.2	5	10-SL-02	24.2	NE	3100 N	310	110 N	150	Gastrointestinal	110	2.2E-01	No	BSL
7439-89-6	IRON	11/11	6520	23800	---	10-SL-04	23800	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**5750**	1.0E+00	No	BKG
7439-92-1	LEAD	11/11	8.6	47.8	---	10S00301	47.8	NE	400	400	400	400	---	400	1.2E-01	No	BSL
7439-95-4	MAGNESIUM	11/11	77.7 J	5910	---	10S00101	5910	NE	---	---	---	---	---	---		No	NUT
7439-96-5	MANGANESE	11/11	13.1	389	---	10-SL-03	389	no	1800 N	**180**	1600 N	3500	Neurological	**229**	2.4E-01	No	BKG
7439-97-6	MERCURY	5/11	0.01 J	0.2	0.08 - 0.14	10-SL-03	0.2	NE	23 N	2.3	3.4 N	3	Neurological	0.49	5.9E-02	No	BSL
7440-02-0	NICKEL	7/11	2 J	7 J	2.3 - 8	10S00601	7	NE	1600 N	160	110 N	340	Body Weight	110	6.4E-02	No	BSL
7440-09-7	POTASSIUM	5/11	69.4 J	299 J	129 - 1000	10S00401	299	NE	---	---	---	---	---	---		No	NUT
7782-49-2	SELENIUM	1/11	0.29 J	0.29 J	0.4 - 1	10S00401	0.29	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	55.7	7.4E-04	No	BSL
7440-23-5	SODIUM	8/11	160 J	387 J	1000	10-SL-04	387	NE	---	---	---	---	---	---		No	NUT
7440-28-0	THALLIUM	1/11	0.13 J	0.13 J	0.44 - 2	10S00501	0.13	NE	5.2 N	0.52	6.3 N	6.1	Liver	1.6	2.1E-02	No	BSL
7440-62-2	VANADIUM	11/11	18.7	63.4	---	10-SL-04	63.4	no	550 N	**55**	15 N	67	NOEL	**15**	**4.2E+00**	No	BKG
7440-66-6	ZINC	10/11	11.2	705	4	10-SL-03	705	NE	23000 N	2300	23000 N	26000	Blood	5750	3.1E-02	No	BSL

TABLE 4-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	5/11	0.1 J	0.2 J	0.24 - 0.5	10S00101-D, 10S00201	0.2	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	6.7E-03	No	BSL
	Petroleum Hydrocarbons (mg/kg)								---								
TTNUS001	**TRPH**	6/6	3.3	666	---	10S00301	666	NA	---	---	340 N	460	Multiple endpoints	**68**	2.0E+00	**Yes**	**ASL**

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 15 chemicals detected in surface soil at Site 10. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 15. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of chemicals impacting the same target organ for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 14 carcinogens were detected in surface soil at Site 10. Therefore, the simple apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 14. For noncarcinogens, neurological effects were identified as the target organ for 7 chemicals. Therefore, the simple apportioned SCTLs for these chemicals are the non-apportioned values divided by 7. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on **acute** toxicity considerations. Therefore, simple apportioned SCTLs were not calculated for these chemicals because SCTLs for most chemicals are based on **chronic** effects.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL, and, for metals, if site concentrations exceed background levels.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:

10S00101	10-SL-01
10S00101-D	10-SL-02
10S00201	10-SL-03
10S00201-D	10-SL-04
10S00301	10-SL-05
10S00401	
10S00501	
10S00601	

Definitions:
C = Carcinogen.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 4-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (ug/kg)																		
78-93-3	2-BUTANONE	1/3	0.04	0.062	0.011 - 0.012	10SS0302	0.062	NA (13)	7300	N	730	3100	N	16000	Developmental	1000	2.0E-05	No	BSL
75-15-0	CARBON DISULFIDE	3/3	0.002 J	0.005 J	---	10SS0503	0.005	NA	360	N	36	200	N	270	Developmental, Neurological	25	2.5E-05	No	BSL
100-41-4	ETHYLBENZENE	2/3	0.002 J	0.02	0.011	10SS0201	0.02	NA	400	sat	400	1100	N	1500	Developmental, Kidney, Liver	180	1.8E-05	No	BSL
108-88-3	TOLUENE	1/3	0.001 J	0.001 J	0.011 - 0.012	10SS0302	0.001	NA	520	sat	520	380	N	7500	Kidney, Liver, Neurological	48	2.6E-06	No	BSL
1330-20-7	TOTAL XYLENES	3/3	0.001 J	0.005 J	---	10SS0302	0.005	NA	270	N	27	5900	N	130	Body Weight, Mortality, Neurological	740	8.5E-07	No	BSL
	Semivolatile Organics (ug/kg)																		
91-57-6	2-METHYLNAPHTHALENE	2/3	0.095 J	0.19 J	0.37	10SS0302-D	0.19	NA	56	N	5.6	80	N	210	Body Weight, Nasal	13	2.4E-03	No	BSL
83-32-9	ACENAPHTHENE	2/3	0.047 J	0.11 J	0.37 - 0.43	10SS0201	0.11	NA	3700	N	370	1900	N	2400	Liver	320	5.8E-05	No	BSL
132-64-9	DIBENZOFURAN	1/3	0.082 J	0.082 J	0.37 - 0.43	10SS0201	0.082	NA	290	N	29	280	N	320	none specified	140	2.9E-04	No	BSL
206-44-0	FLUORANTHENE	1/3	0.046 J	0.07 J	0.37 - 0.39	10SS0302	0.07	NA	2300	N	230	2900	N	3200	Blood, Kidney, Liver	480	2.4E-05	No	BSL
86-73-7	FLUORENE	2/3	0.055 J	0.14 J	0.37 - 0.43	10SS0201	0.14	NA	2700	N	270	2200	N	2600	Blood	440	6.4E-05	No	BSL
91-20-3	NAPHTHALENE	2/3	0.16 J	0.26 J	0.37	10SS0302-D	0.26	NA	56	N	5.6	40	N	55	Body Weight, Nasal	7	6.5E-03	No	BSL
85-01-8	PHENANTHRENE	2/3	0.077 J	0.13 J	0.37	10SS0302	0.13	NA	2300	N	230	2000	N	2200	Kidney	330	6.5E-05	No	BSL
129-00-0	PYRENE	1/3	0.051 J	0.051 J	0.37 - 0.41	10SS0302-D	0.051	NA	2300	N	230	2200	N	2400	Kidney	370	2.3E-05	No	BSL
	Pesticides PCBs (ug/kg)																		
72-54-8	4,4'-DDD	2/3	0.0014 J	0.01	0.016 - 0.017	10SS0201	0.01	NA	2.4	C	0.30	4.6	C	4.2	---	0.7		No	BSL
72-55-9	4,4'-DDE	2/3	0.00066 J	0.0093	0.016 - 0.017	10SS0201	0.0093	NA	1.7	C	0.21	3.3	C	2.9	---	0.5	2.8E-03	No	BSL
50-29-3	4,4'-DDT	1/3	0.0039 J	0.0039 J	0.003.7 - 0.017	10SS0201	0.0039	NA	1.7	C	0.21	3.3	C	2.9	---	0.5	1.2E-03	No	BSL
309-00-2	**ALDRIN**	1/3	0.0039 J	0.0039 J	0.0019 - 0.0088	10SS0201	0.0039	NA	0.029	C	**0.0036**	0.07	C	0.06	---	0.01	5.6E-02	**Yes**	**ASL**
60-57-1	**DIELDRIN**	1/3	0.005	0.005	0.0037 - 0.017	10SS0201	0.005	NA	0.03	C	**0.0038**	0.07	C	0.06	---	0.01	7.1E-02	**Yes**	**ASL**
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	3/3	11300	12700	---	10SS0302-D	12700	no	76,000	N	**7600**	72000	N	80000	Body Weight	**12000**	1.8E-01	No	BKG
7440-36-0	**ANTIMONY**	1/3	7.9 J	7.9 J	2.8 - 3.1	10SS0201	7.9	yes	31	N	**3.1**	26	N	27	Blood, Mortality	**5.2**	3.0E-01	**Yes**	**ASL**
7440-38-2	ARSENIC	3/3	1.7 J	3.7	---	10SS0503	3.7	no	0.39	C	**0.05**	0.8	C	2.1	---	**0.11**	**4.6E+00**	No	BKG
7440-39-3	BARIUM	3/3	12.5 J	28.2 J	---	10SS0503	28.2	NE (14)	5400	N	540	110	N	120	Cardiovascular	110	2.6E-01	No	BSL
7440-41-7	BERYLLIUM	3/3	0.13 J	0.4 J	---	10SS0201	0.4	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	3.3E-03	No	BSL
7440-43-9	CADMIUM	1/3	0.91 J	0.91 J	0.67 - 0.75	10SS0201	0.91	NE	37	N	3.7	75	N	82	Kidney	75	1.2E-02	No	BSL
7440-70-2	CALCIUM	2/3	502 J	4100	729 - 1020	10SS0201	4100	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	**CHROMIUM**	3/3	11.2	207	---	10SS0201	207	yes	210	C	**26**	210	C	210	---	**30**	9.9E-01	**Yes**	**ASL**
7440-48-4	COBALT	1/3	2.5 J	2.5 J	0.75 - 0.84	10SS0201	2.5	NE	900	C	113	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	588	5.3E-04	No	BSL
7440-50-8	COPPER	3/3	4.5 J	11.9	---	10SS0201	11.9	NE	3100	N	310	110	N	150	Gastrointestinal	110	1.1E-01	No	BSL
7439-89-6	IRON	3/3	7270 J	44600	---	10SS0201	44600	no	23000	N	**2300**	23000	N	53000	Blood, Gastrointestinal	**4600**	1.9E+00	No	BKG
7439-92-1	LEAD	3/3	13.4	82.4	---	10SS0201	82.4	NE	400		400	400		400	---	400	2.1E-01	No	BSL
7439-95-4	MAGNESIUM	3/3	90.9 J	167 J	---	10SS0302-D	167	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	3/3	13.3	124	---	10SS0201	124	no	1800	N	180	1600	N	3500	Neurological	200	7.8E-02	No	BSL,BKG
7439-97-6	MERCURY	2/3	0.08 J	0.12 J	0.09 - 0.18	10SS0201	0.12	NE	23	N	2.3	3.4	N	3	Neurological	0.43	3.5E-02	No	BSL
7440-02-0	NICKEL	2/3	1.9 J	4.2 J	3 - 3.2	10SS0201	4.2	NE	1600	N	160	110	N	340	Body Weight	110	3.8E-02	No	BSL
7440-09-7	POTASSIUM	2/3	185 J	299 J	154 - 171	10SS0302-D	299	NE	---		---	---		---	---	---	---	No	NUT
7782-49-2	SELENIUM	1/3	0.67 J	0.67 J	0.47 - 0.53	10SS0302-D	0.67	NE	390	N	39	390	N	440	Hair Loss, Neurological, Skin	48.8	1.7E-03	No	BSL
7440-22-4	SILVER	2/3	0.46 J	1 J	0.36 - 0.51	10SS0201	1	NE	390	N	39	390	N	410	Skin	195	2.6E-03	No	BSL
7440-23-5	SODIUM	2/3	182 J	212 J	208 - 210	10SS0503	212	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	3/3	18.8 J	104	---	10SS0201	104	no	550	N	**55**	15	N	67	NOEL	**15**	**6.9E+00**	No	BKG
7440-66-6	ZINC	3/3	17.2	27.3	---	10SS0201	27.3	NE	23000	N	2300	23000	N	26000	Blood	4600	1.2E-03	No	BSL

TABLE 4-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	1/3	0.49 J	0.49 J	0.1 - 0.11	10SS0503	0.49	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	1.6E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 15 chemicals detected in surface soil at Site 10. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 15. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of chemicals impacting the same target organ for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 7 carcinogens were detected in surface soil at Site 10. Therefore, the simple apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 7. For noncarcinogens, neurological effects were identified as the target organ for 8 chemicals. Therefore, the simple apportioned SCTLs for these chemicals are the non-apportioned values divided by 8. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on **acute** toxicity considerations. Therefore, simple apportioned SCTLs were not calculated for these chemicals because SCTLs for most chemicals are based on **chronic** effects.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL, and, for metals, if site concentrations exceed background levels.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
10SS0201
10SS0302
10SS0302-D
10SS0503

Definitions:
C = Carcinogen.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 4-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	2E-05	- -	Carcinogenic PAHs	- -	0.5	- -
	Subsurface Soil	8E-07	- -	- -	- -	1	- -
Industrial Workers	Surface Soil	5E-06	- -	- -	Carcinogenic PAHs	0.05	- -
	Subsurface Soil	5E-07	- -	- -	- -	0.07	- -
Construction Workers	Surface Soil	2E-06	- -	- -	- -	0.2	- -
	Subsurface Soil	1E-05	- -	- -	Chromium	0.8	- -
Maintenance Workers	Surface Soil	1E-06	- -	- -	- -	0.004	- -
Adolescent Recreational Users	Surface Soil	2E-06	- -	- -	Carcinogenic PAHs	0.01	- -
Adult Recreational Users	Surface Soil	1E-06	- -	- -	- -	0.007	- -
Lifelong Recreational Users	Surface Soil	3E-06	- -	- -	Carcinogenic PAHs	NA	- -

Notes:
NA - Not applicable.
HI - Hazard Index.

TABLE 4-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
591-78-6	2-HEXANONE	0.004 J	0.004	5.1 N	7.8E-04	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.001 J	0.001	5900 N	1.7E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
83-32-9	ACENAPHTHENE	0.11 J	0.11	1900 N	5.8E-05	NA	No	maximum < SCTL
120-12-7	ANTHRACENE	0.27 J	0.27	18000 N	1.5E-05	NA	No	maximum < SCTL
191-24-2	BENZO(G,H,I)PERYLENE	3.8	1	2300 N	1.7E-03	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3.3	0.8	76 C	4.3E-02	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.085 J	0.085	15000 N	5.7E-06	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.052 J	0.052	280 N	1.9E-04	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.096 J	0.096	54000 N	1.8E-06	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	2.3	1	2900 N	7.9E-04	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.12 J	0.12	2200 N	5.5E-05	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	1.2	0.7	2000 N	6.0E-04	NA	No	maximum < SCTL
129-00-0	PYRENE	1.8	1	2200 N	8.2E-04	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	4.2	2.3	0.1 C	**4.2E+01**	NA	**Yes**	maximum > SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.0044 J	0.0044	4.6 C	9.6E-04	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.037	0.037	3.3 C	1.1E-02	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.035	0.03	3.3 C	1.1E-02	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.0052 J	0.0052	3.1 C	1.7E-03	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.39	0.39	0.5 C	7.8E-01	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.06 J	0.06	0.5 C	1.2E-01	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.019	0.019	0.07 C	2.7E-01	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.0064	0.0064	3.1 C	2.1E-03	NA	No	maximum < SCTL
76-44-8	HEPTACHLOR	0.0052	0.0052	0.2 C	2.6E-02	NA	No	maximum < SCTL
1024-57-3	HEPTACHLOR EPOXIDE	0.0024	0.0024	0.1 C	2.4E-02	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	37000	24400	72000 N	5.1E-01	no	No	(8)
7440-38-2	ARSENIC	8.8	5.9	0.8 C	**1.1E+01**	no	No	(8)
7440-39-3	**BARIUM**	361 J	57	110 N	**3.3E+00**	yes	**Yes**	maximum > SCTL
7440-41-7	BERYLLIUM	0.26 J	0.26	120 N	2.2E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	2.4	1.3	75 N	3.2E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	23200	5290	---	---	NE	No	maximum < SCTL

TABLE 4-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 2 OF 3

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7440-47-3	CHROMIUM	31.9	23.2	210 C	1.5E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	2.4	4700 N	5.1E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	24.2	16.9	110 N	2.2E-01	NE	No	maximum < SCTL
7439-89-6	IRON	23800	16200	23000 N	**1.0E+00**	no	No	(8)
7439-92-1	LEAD	47.8	27.2	400	1.2E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	5910	1490	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	389	165	1600 N	2.4E-01	no	No	maximum < SCTL
7439-97-6	MERCURY	0.2	0.12	3.4 N	5.9E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	7 J	6.1	110 N	6.4E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	299 J	221	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.29 J	0.29	390 N	7.4E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	387 J	387	---	---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.13 J	0.13	6.3 N	2.1E-02	NE	No	maximum < SCTL
7440-62-2	VANADIUM	63.4	41.9	15 N	**4.2E+00**	no	No	(8)
7440-66-6	ZINC	705	239	23000 N	3.1E-02	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.2 J	0.17	30 N	6.7E-03	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	**TRPH**	666	666	340 N	**2.0E+00**	NA	**Yes**	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

TABLE 4-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 10 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

10S00101	10-SL-01
10S00201	10-SL-02
10S00301	10-SL-03
10S00401	10-SL-04
10S00501	10-SL-05
10S00601	

Definitions:
C = Carcinogen.
COC = Chemical of concern.
J = Estimated value.
N = Noncarcinogen.

TABLE 4-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
591-78-6	2-HEXANONE	1/11	0.004 J	0.004	10S00201-D	NA (5)	4200
1330-20-7	TOTAL XYLENES	1/11	0.001 J	0.001	10-SL-04	NA	140
	Semivolatile Organics (mg/kg)						
83-32-9	ACENAPHTHENE	2/11	0.11 J	0.11	10S00301	NA	130
120-12-7	ANTHRACENE	3/11	0.27 J	0.27	10S00101-D	NA	6.1
191-24-2	BENZO(G,H,I)PERYLENE	2/11	3.8	1	10S00401	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/11	3.3	0.8	10S00201	NA	31000
85-68-7	BUTYL BENZYL PHTHALATE	4/11	0.085 J	0.085	10-SL-02	NA	890
132-64-9	DIBENZOFURAN	1/11	0.052 J	0.052	10S00301	NA	210
84-66-2	DIETHYL PHTHALATE	1/11	0.096 J	0.096	10-SL-03	NA	2000
206-44-0	FLUORANTHENE	8/11	2.3	1	10S00101-D	NA	---
86-73-7	FLUORENE	1/11	0.12 J	0.12	10S00301	NA	160
85-01-8	PHENANTHRENE	6/11	1.2	0.7	10S00101-D	NA	---
129-00-0	PYRENE	9/11	1.8	1	10S00401	NA	85
50-32-8	BAP EQUIVALENT	9/11	4.2	2.3	10S00401	NA	
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	1/11	0.0044 J	0.0044	10S00301	NA	---
72-55-9	4,4'-DDE	1/11	0.037	0.037	10S00401	NA	---
50-29-3	4,4'-DDT	7/11	0.035	0.03	10S00401	NA	---
5103-71-9	ALPHA-CHLORDANE	2/11	0.0052 J	0.0052	10S00401	NA	---
11097-69-1	AROCLOR-1254	5/11	0.39	0.4	10S00201-D	NA	---
11096-82-5	AROCLOR-1260	2/11	0.06 J	0.06	10-SL-02	NA	---
60-57-1	DIELDRIN	1/11	0.019	0.019	10S00401	NA	---
5103-74-2	GAMMA-CHLORDANE	1/11	0.0064	0.0064	10S00601	NA	---
76-44-8	HEPTACHLOR	1/11	0.0052	0.0052	10S00601	NA	---
1024-57-3	HEPTACHLOR EPOXIDE	1/11	0.0024	0.0024	10S00601	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	6/6	666	666	10S00301	NA	

TABLE 4-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

10S00201	10S00601
10S00201-D	10-SL-03
10S00301	10-SL-04
10S00401	10-SL-05
10S00501	

TABLE 4-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
591-78-6	2-HEXANONE	0.004 J	0.004	34	N	1.2E-04	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.001 J	0.001	40000	N	2.5E-08	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
83-32-9	ACENAPHTHENE	0.11 J	0.11	18000	N	6.1E-06	NA	No	maximum < SCTL
120-12-7	ANTHRACENE	0.27 J	0.27	260000	N	1.0E-06	NA	No	maximum < SCTL
191-24-2	BENZO(G,H,I)PERYLENE	3.8	1	41000	N	9.3E-05	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3.3	0.8	280	C	1.2E-02	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.085 J	0.085	320000	N	2.7E-07	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.052 J	0.052	5000	N	1.0E-05	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.096 J	0.096	920000	N	1.0E-07	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	2.3	1	48000	N	4.8E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.12 J	0.12	28000	N	4.3E-06	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	1.2	0.74	30000	N	4.0E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	1.8	1	37000	N	4.9E-05	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	4.2	2.3	0.5	C	**8.5E+00**	NA	**Yes**	maximum > SCTL
	Pesticides PCBs (mg/kg)								
72-54-8	4,4'-DDD	0.0044 J	0.0044	18	C	2.4E-04	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.037	0.037	13	C	2.8E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.035	0.03	13	C	2.7E-03	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.0052 J	0.0052	12	C	4.3E-04	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.39	0.36	2.1	C	1.9E-01	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.06 J	0.06	2.1	C	2.9E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.019	0.019	0.3	C	6.3E-02	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.0064	0.0064	12	C	5.3E-04	NA	No	maximum < SCTL
76-44-8	HEPTACHLOR	0.0052	0.0052	0.9	C	5.8E-03	NA	No	maximum < SCTL
1024-57-3	HEPTACHLOR EPOXIDE	0.0024	0.0024	0.4	C	6.0E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	37000	24400	---	N	---	no	No	(8)
7440-38-2	ARSENIC	8.8	5.9	3.7	C	**2.4E+00**	no	No	(8)
7440-39-3	BARIUM	361 J	57	87000	N	4.1E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.26 J	0.26	800	N	3.3E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	2.4	1.3	1300	N	1.8E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	23200	5290	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	31.9	23.2	420	C	7.6E-02	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	2.4	110000	N	2.2E-05	NE	No	maximum < SCTL

TABLE 4-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7440-50-8	COPPER	24.2	16.9	76000 N	3.2E-04	NE	No	maximum < SCTL
7439-89-6	IRON	23800	16200	480000 N	5.0E-02	no	No	maximum < SCTL
7439-92-1	LEAD	47.8	27.2	920	5.2E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	5910	1490	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	389	165	22000 N	1.8E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.2	0.12	26 N	7.7E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	7 J	6.1	28000 N	2.5E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	299 J	221	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.29 J	0.29	10000 N	2.9E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	387 J	387	---	---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.13 J	0.13	160 N	8.1E-04	NE	No	maximum < SCTL
7440-62-2	VANADIUM	63.4	41.9	7400 N	8.6E-03	no	No	maximum < SCTL
7440-66-6	ZINC	705	239	560000 N	1.3E-03	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.2 J	0.17	39000 N	5.1E-06	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	TRPH	666	666	2500 N	2.7E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 10 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

TABLE 4-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments

Associated Samples:

10S00101	10-SL-01
10S00201	10-SL-02
10S00301	10-SL-03
10S00401	10-SL-04
10S00501	10-SL-05
10S00601	

Definitions:
C = Carcinogen.
COC = Chemical of concern.
J = Estimated value.
N = Noncarcinogen.

TABLE 4-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
591-78-6	2-HEXANONE	0.004 J	0.004	290 N	1.4E-05	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.001 J	0.001	19000 N	5.3E-08	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
83-32-9	ACENAPHTHENE	0.11 J	0.11	190000 N	5.8E-07	NA	No	maximum < SCTL
120-12-7	ANTHRACENE	0.27 J	0.27	1000000 N	2.7E-07	NA	No	maximum < SCTL
191-24-2	BENZO(G,H,I)PERYLENE	3.8	1	110000 N	3.5E-05	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3.3	0.8	480 C	6.9E-03	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.085 J	0.085	370000 N	2.3E-07	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.052 J	0.052	5900 N	8.8E-06	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.096 J	0.096	1400000 N	6.9E-08	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	2.3	1	64000 N	3.6E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.12 J	0.12	140000 N	8.6E-07	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	1.2	0.74	110000 N	1.1E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	1.8	1	110000 N	1.6E-05	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	4.2	2.3	0.8 C	**5.3E+00**	NA	**Yes**	maximum > SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.0044 J	0.0044	39 C	1.1E-04	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.037	0.037	27 C	1.4E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.035	0.03	27 C	1.3E-03	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.0052 J	0.0052	19 C	2.7E-04	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.39	0.36	2.8 C	1.4E-01	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.06 J	0.06	2.8 C	2.1E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.019	0.019	0.4 C	4.8E-02	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.0064	0.0064	19 C	3.4E-04	NA	No	maximum < SCTL
76-44-8	HEPTACHLOR	0.0052	0.0052	1.5 C	3.5E-03	NA	No	maximum < SCTL
1024-57-3	HEPTACHLOR EPOXIDE	0.0024	0.0024	0.7 C	3.4E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	37000	24400	--- N	---	no	No	(8)
7440-38-2	ARSENIC	8.8	5.9	6.2 C	**1.4E+00**	no	No	(8)
7440-39-3	BARIUM	361 J	57	250000 N	1.4E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.26 J	0.26	7200 N	3.6E-05	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	2.4	1.3	1300 N	1.8E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	23200	5290	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	31.9	23.2	5900 C	5.4E-03	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	2.4	25000 N	9.6E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	24.2	16.9	150000 N	1.6E-04	NE	No	maximum < SCTL

TABLE 4-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
7439-89-6	IRON	23800	16200	1100000 N	2.2E-02	no	No	maximum < SCTL
7439-92-1	LEAD	47.8	27.2	1900	2.5E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	5910	1490	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	389	165	69000 N	5.6E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.2	0.12	1100 N	1.8E-04	NE	No	maximum < SCTL
7440-02-0	NICKEL	7 J	6.1	73000 N	9.6E-05	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	299 J	221	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.29 J	0.29	18000 N	1.6E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	387 J	387	---	---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.13 J	0.13	260 N	5.0E-04	NE	No	maximum < SCTL
7440-62-2	VANADIUM	63.4	41.9	3600 N	1.8E-02	no	No	maximum < SCTL
7440-66-6	ZINC	705	239	1100000 N	6.4E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.2 J	0.17	36800 N	5.4E-06	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	TRPH	666	666	31000 N	2.1E-02	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 SCTLs for recreational users were developed using the methods presented in Chapter 62-777, F.A.C., August 1999 and the most current toxicological data available in IRIS. The recreational users are assumed to b exposed 45 days per year by ingestion, inhalation, and dermal contact. Calculations of the recreational SCTLs are presented in Appendix C.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 10 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

TABLE 4-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments

Associated Samples:

10S00101	10-SL-01
10S00201	10-SL-02
10S00301	10-SL-03
10S00401	10-SL-04
10S00501	10-SL-05
10S00601	

Definitions:
C = Carcinogen.
COC = Chemical of concern.
J = Estimated value.
N = Noncarcinogen.

TABLE 4-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.062	0.062	3100	N	2.0E-05	NA (6)	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.005 J	0.005	200	N	2.5E-05	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.02	0.02	1100	N	1.8E-05	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.001 J	0.001	380	N	2.6E-06	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.005 J	0.005	5900	N	8.5E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	0.19 J	0.19	80	N	2.4E-03	NA	No	maximum < SCTL
83-32-9	ACENAPHTHENE	0.11 J	0.11	1900	N	5.8E-05	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.082 J	0.082	280	N	2.9E-04	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.07 J	0.07	2900	N	2.4E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.14 J	0.14	2200	N	6.4E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.26 J	0.26	40	N	6.5E-03	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.13 J	0.13	2000	N	6.5E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	0.051 J	0.051	2200	N	2.3E-05	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-54-8	4,4'-DDD	0.01	0.01	4.6	C	2.2E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.0093	0.0093	3.3	C	2.8E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.0039 J	0.0039	3.3	C	1.2E-03	NA	No	maximum < SCTL
309-00-2	ALDRIN	0.0039 J	0.0039	0.07	C	5.6E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.005	0.005	0.07	C	7.1E-02	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	12700	12700	72000	N	1.8E-01	no	No	(8)
7440-36-0	ANTIMONY	7.9 J	7.9	26	N	3.0E-01	yes	No	maximum < SCTL
7440-38-2	ARSENIC	3.7	3.7	0.8	C	4.6E+00	no	No	(8)
7440-39-3	BARIUM	28.2 J	28.2	110	N	2.6E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.4 J	0.4	120	N	3.3E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	0.91 J	0.91	75	N	1.2E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	4100	4100	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	207	207	210	C	9.9E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	2.5 J	2.5	4700	N	5.3E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	11.9	11.9	110	N	1.1E-01	NE	No	maximum < SCTL
7439-89-6	IRON	44600	44600	23000	N	1.9E+00	no	No	(8)
7439-92-1	LEAD	82.4	53.7	400		---	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	167 J	167	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	124	124	1600	N	7.8E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.12 J	0.12	3.4	N	3.5E-02	NE	No	maximum < SCTL

TABLE 4-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7440-02-0	NICKEL	4.2 J	4.2	110	N	3.8E-02	NE	No	<10 % Acute SCTL
7440-09-7	POTASSIUM	299 J	299	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.67 J	0.67	390	N	1.7E-03	NE	No	maximum < SCTL
7440-22-4	SILVER	1 J	1	390	N	---	NE	No	maximum < SCTL
7440-23-5	SODIUM	212 J	212	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	104	104	15	N	**6.9E+00**	no	No	(8)
7440-66-6	ZINC	27.3	27.3	23000	N	1.2E-03	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.49 J	0.49	30	N	1.6E-02	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 10 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
10SS0201
10SS0302
10SS0302-D
10SS0503

Definitions:
C = Carcinogen.
COC = Chemical of concern.
J = Estimated value.
N = Noncarcinogen.

TABLE 4-9

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	1/3	0.062	0.062	10SS0302	NA (5)	25000000
75-15-0	CARBON DISULFIDE	3/3	0.005 J	0.005	10SS0503	NA	730000
100-41-4	ETHYLBENZENE	2/3	0.02	0.02	10SS0201	NA	400000
108-88-3	TOLUENE	1/3	0.001 J	0.001	10SS0302	NA	650000
1330-20-7	TOTAL XYLENES	3/3	0.005 J	0.005	10SS0302	NA	140000
	Semivolatile Organics (mg/kg)						
91-57-6	2-METHYLNAPHTHALENE	2/3	0.19 J	0.19	10SS0302-D	NA	---
83-32-9	ACENAPHTHENE	2/3	0.11 J	0.11	10SS0201	NA	130000
132-64-9	DIBENZOFURAN	1/3	0.082 J	0.082	10SS0201	NA	210000
206-44-0	FLUORANTHENE	1/3	0.07 J	0.07	10SS0302	NA	---
86-73-7	FLUORENE	2/3	0.14 J	0.14	10SS0201	NA	160000
91-20-3	NAPHTHALENE	2/3	0.26 J	0.26	10SS0302-D	NA	220000
85-01-8	PHENANTHRENE	2/3	0.13 J	0.13	10SS0302	NA	---
129-00-0	PYRENE	1/3	0.051 J	0.051	10SS0302-D	NA	85000
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	2/3	0.01	0.01	10SS0201	NA	---
72-55-9	4,4'-DDE	2/3	0.0093	0.0093	10SS0201	NA	---
50-29-3	4,4'-DDT	1/3	0.0039 J	0.0039	10SS0201	NA	---
309-00-2	ALDRIN	1/3	0.0039 J	0.0039	10SS0201	NA	---
60-57-1	DIELDRIN	1/3	0.005	0.005	10SS0201	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:	10SS0302-AVG
10SS0201	10SS0302-D
10SS0201	10SS0503
10SS0302	10SS0503

5.0 SITE 11, SOUTHEAST OPEN DISPOSAL AREA B

This section presents the results of the HHRA and SLERA conducted for surface and subsurface soil samples collected at Site 11. The assessment updates a risk evaluation presented in the 2000 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA guidelines and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

5.1 SITE DESCRIPTION

Site 11 is located along the eastern facility property boundary near the South Air Field. Sites 9 and 10 are located to the northwest and Site 13 is immediately to the southeast. The site is identified as a 3-acre area encompassing an old borrow pit used as an open disposal area from 1943 until approximately 1970. Access to the site was unrestricted during its use. The site received a wide variety of wastes including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils. When disposal operations were discontinued in 1970, a final permeable native soil covering was placed over the site and pine trees were planted.

The approximate location of Site 11 is shown on Figure 1-2 of the 2000 RI report. There are no permanent surface water bodies in the immediate vicinity of Site 11. There are currently no buildings at Site 11, and the site is densely vegetated with native species. Site 11 is vacant, unused land at this time.

5.2 SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATION AND REMOVAL ACTION SAMPLING OF SOILS

The surface soil dataset for Site 11 includes data from four samples (11-SL-01, 11-SL-02, 11-SL-03, and 11-SL-05) collected during the 1992 Phase IIA field investigation, 13 samples (11SO0101 through 11SO1301) collected during the 1996 Phase IIB field investigation, and 38 samples collected as part of the 1999 removal action. All of the Phase IIA samples and five of the Phase IIB samples were analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, cyanide, and TRPH. Nine of the Phase IIB samples (i.e., eight samples plus one duplicate) were analyzed for lead only. All samples were collected from the 0- to 12-inch bgs interval.

As part of a source removal action for cPAHs conducted by CH2M Hill, soils in the vicinity of location 11-SL-04 were excavated in June 1999. Therefore, the sample from this location was not included in the surface soil dataset for the HHRA. Confirmation samples collected from the bottom of the excavation indicated contaminant concentrations were less than State and federal screening criteria. As part of the 1999 field investigation associated with the removal action, 38 additional samples were collected to delineate lead around sample location 11-SL-02. All of the 1999 samples were analyzed for lead, seven were analyzed for benzo(a)pyrene, five were analyzed for select pesticides, and three were analyzed for TRPH.

For the purposes of characterizing waste materials, test pits were excavated at locations where geophysical anomalies potentially defined the location of buried materials. The subsurface soil dataset for Site 11 consists of three samples; one sample was collected from each of three test pits (TP-11-01, TP-11-02, and TP-11-03) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from a depth interval of 5- to 6-feet bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the Site 11 surface and subsurface soil samples are presented in Tables 5-1 and 5-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database in provided in Appendix A.

Most surface and subsurface soil sample locations are presented on Figures 3-2 of the 2000 RI report. Other sample locations are described within the text of the report.

5.3 HUMAN HEALTH RISK ASSESSMENT

5.3.1 <u>Selection of COPCs for Human Health Risk Assessment</u>

The direct contact, risk-based screening levels defined in Section 2.0 were used to select COPCs for the Site 11 surface and subsurface soils. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soils are presented as Tables 5-1 and 5-2, respectively.

5.3.1.1 Surface Soil

One VOC, two SVOCs, nine pesticides/PCBs, 22 inorganics, TRPH, and cyanide were detected in the surface soil samples collected at Site 11. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 5-1. Also presented in Table 5-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in surface soil at maximum concentrations exceeding the direct contact, risk-based COPC screening levels and background concentrations, and were retained as COPCs for surface soil at Site 11:

- Benzo(a)pyrene
- Pesticides/PCBs (4,4'-DDT, alpha-chlordane, dieldrin, gamma-chlordane, heptachlor, and heptachlor epoxide)
- Lead
- TPRH

Benzo(a)pyrene was only detected in one of 16 surface soil samples. Benzo(a)pyrene, 4,4'-DDT, alpha-chlordane, and gamma-chlordane were detected at concentrations exceeding the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Dieldrin was detected at concentrations exceeding the simple apportioned and non-apportioned PRGs and SCTLs. Heptachlor and heptachlor epoxide were detected at concentrations exceeding the simple apportioned and non-apportioned PRGs and simple apportioned SCTL but were less than the non-apportioned SCTL. The maximum detected TRPH concentration exceeded the simple apportioned SCTL only.

Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria (Table 5-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 11. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 11 surface soils.

Antimony was not selected as a COPC based on the site data-to-background data comparisons presented in Appendix A.

5.3.1.2 Subsurface Soil

Three VOCs, one SVOC, seven pesticides/PCBs, and 19 inorganics were detected in three subsurface soil samples collected at Site 11. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 5-2. The following chemicals were detected in the subsurface soils at maximum concentrations exceeding the direct contact, risk-based COPC screening levels and background concentrations, and were retained as COPCs for subsurface soil at Site 11:

- Pesticides/PCBs (aldrin, Aroclor-1254, Aroclor-1260, and dieldrin)
- Cadmium

Aldrin, Aroclor-1254, and Aroclor-1260 were only detected in one sample. Concentrations of aldrin and cadmium exceeded the simple apportioned PRGs but were less than the non-apportioned PRGs and simple apportioned and non-apportioned SCTLs. Concentrations of Aroclor-1260 exceeded the simple apportioned PRG and SCTL but were less than the non-apportioned PRG and SCTL. Concentrations of Aroclor-1254 and dieldrin exceeded the simple apportioned and non-apportioned PRGs and simple apportioned SCTLs but were less than the non-apportioned SCTL.

Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 11. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 11 subsurface soils.

5.3.2 <u>Risk Characterization</u>

This section provides a characterization of the human health risks associated with the potential exposures to chemicals in surface and subsurface soils at Site 11. As discussed in Section 2.0, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

5.3.2.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 11 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs. Potential risks and HIs were calculated using the methodology presented in Section 2.0 and are summarized in Table 5-3. The results are discussed below. Chemical specific risks for Site 11 are presented in Appendix B.

Non-Carcinogenic Risk

Cumulative HIs for exposures to surface and subsurface soil by all receptors were less than one, indicating adverse non-carcinogenic effects are not anticipated for these receptors under the conditions established in the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to surface and subsurface soil were within the USEPA's target risk range of 10^{-4} to 10^{-6} for all receptors. However, ILCRs exceeded the State of Florida's target risk level of 1 x 10^{-6} for exposures to surface soil by residents. Only the chemical-specific ILCR for dieldrin exceeded 1 x 10^{-6} for exposures to surface soil by residents.

Risks from Lead

Lead was identified as a COPC in surface soil at Site 11. The maximum detected concentration of 2,230 mg/kg in surface soil (location 11-SL-02) exceeded the USEPA screening level of 400 mg/kg for residential exposures. However, extensive surface soil sampling for lead in the immediate vicinity of location 11-SL-02 suggests very limited lead contamination in this area. The arithmetic mean lead concentration for 30 locations established by a 25-foot sampling grid in the vicinity of location 11-SL-02 does not exceed 150 mg/kg. (see Appendix J of the 2000 RI report).

Hypothetical future residential exposures to lead in surface soil were evaluated using the IEUBK lead model (USEPA, May 2002). As recommended by the IEUBK model, the average concentration of lead in surface soil (93.1 mg/kg, all available surface soil data considered) was used as the EPC for soil. Default parameters were used for the rest of the model input parameters. IEUBK model outputs are included in Appendix B. The lead concentration of 93.1 mg/kg in surface soil results in less than 1 percent of future on-site child residents having a blood lead level greater than 10 µg/dL and a geometric mean blood lead level of 2.4 µg/dL. These results do not exceed the USEPA goal, described in the 1994 OSWER Directive, of no more than 5 percent of children exceeding a 10 µg/dL blood lead level.

Exposures to lead in surface soil by construction workers and occupational workers were evaluated using a slope-factor approach developed by the USEPA TRW for Lead (January 2003). The receptor of concern addressed by the TRW model is the fetus carried by a pregnant worker. As recommended by the model, the average lead concentration (93.1 mg/kg) in surface soil was used as the EPC. ILCRs and HIs were calculated for most chemicals using RME assumptions, whereas the adult lead model guidance recommends the use of CTE assumptions in evaluating adult exposures to lead in soil (USEPA, January

2003). Therefore, the incidental soil ingestion rate was assumed to be 200 mg/day for the construction worker and 50 mg/day for the occupational worker (USEPA, April 2004) and the exposure frequency was assumed to be 219 days per year. Values of 2.07 and 1.39 μg/dL were used for the standard deviation and baseline blood lead concentration, respectively, which are the recommended FDEP values (FDEP, February 2004). Default parameters were used for the remaining model input parameters. Results of the model runs are included in Appendix B. For construction workers exposed to surface soil, the average lead soil concentration of 93.1 mg/kg results in 0.8 percent of receptors (fetuses) having a blood lead level greater than 10 μg/dL and a geometric mean blood lead level of 1.9 μg/dL. For occupational workers exposed to surface soil, the average lead soil concentration of 93.1 mg/kg results in 0.3 percent of receptors (fetuses) having a blood lead level greater than 10 μg/dL and a geometric mean blood lead level of 1.5 μg/dL. These results do not exceed the USEPA goal of no more than 5 percent of children (or the fetuses of exposed women) exceeding a 10 μg/dL blood lead level.

5.3.2.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 11 conducted using proposed Florida Rule 62-780 FAC as discussed in Section 2.0. The results are summarized in Tables 5-4 through 5-8 and are discussed below.

5.3.2.2.1 <u>Surface Soil</u>

Level 1 Evaluation (Residential)

Table 5-4 presents a comparison of the maximum concentrations and EPCs for surface soil to the FDEP residential SCTLs. The following chemicals were identified as exceeding the Level 1 SCTLs and were retained as potential COCs for residential exposures to surface soil at Site 11:

- Dieldrin
- Lead

However, only the dieldrin concentrations reported for locations 11-SL-02 (the lead “hot spot” location) and for the confirmation samples associated with the 11-SL-04 removal action exceed the non-apportioned Level 1 SCTL. Although the maximum detected concentration of lead exceeded three times the residential SCTL, lead concentrations for only two of the 47 surface soil samples analyzed exceed 400 mg/kg.

The maximum detected concentrations and EPCs for arsenic and vanadium also exceeded the Level 1 criteria, and the maximum detected concentration of arsenic exceeded three times the residential SCTL.

However, please see the preceding discussion (Section 5.3.1) regarding these metals. Arsenic and vanadium were not retained as potential COCs for residential exposures to surface soil at Site 11.

As shown in Table 5-5, the concentrations of all organics in surface soil were significantly less than the C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial)

The results of the Level 1 evaluation identified two COCs; therefore, a Level 2 evaluation was conducted. A comparison of the maximum detected concentrations and EPCs for surface soil to the FDEP industrial SCTLs is presented in Table 5-6. No chemicals were identified as exceeding the Level 2 SCTLs. Therefore, no chemicals were retained as COCs for industrial exposures to surface soil.

The maximum concentration and EPC for arsenic also exceeded the Level 2 criteria. However, please see the preceding discussion (Section 5.3.1) regarding arsenic. Arsenic was not retained as a potential COCs for industrial exposures to surface soil at the Site 11.

Level 3 (Recreational)

No COCs were identified in the Level 2 evaluation; consequently, a Level 3 evaluation was not required.

5.3.2.2.2 <u>Subsurface Soil</u>

Level 1 Evaluation (Residential)

Table 5-7 presents a comparison of the maximum concentrations and EPCs for subsurface soil to FDEP residential SCTLs. No chemicals were identified as exceeding the Level 1 SCTLs or retained as potential COCs for residential exposures to subsurface soil at Site 11.

The EPCs for arsenic and vanadium exceeded the Level 1 criteria, and the maximum detected concentration of arsenic exceeded three times the residential SCTL. However, please see the preceding discussion (Section 5.3.1) regarding these metals. Arsenic and vanadium were not retained as COCs for residential exposures to subsurface soil at the Site 11.

As shown in Table 5-8, the concentrations of all organics in subsurface soil were significantly less than the C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 (Industrial) and Level 3 (Recreational)

No COCs were identified in the Level 1 evaluation; consequently, Level 2 and 3 evaluations were not required.

5.3.3 Uncertainty Analysis

A summary of the uncertainties associated with the HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

5.3.3.1 Uncertainty Associated with TRPH

Although TRPH was identified as a COPC in surface soil, potential risks from exposures to TRPH in surface soil were not evaluated in the quantitative risk assessment (Section 5.4.1) because no toxicity criteria are available for TRPH. However, FDEP has derived SCTLs for TRPH using methodology developed by the Massachusetts Department of Environmental Protection (MADEP). The FDEP SCTLs were used to estimate potential risks following the methodology presented in Section 2.0. The resulting HIs are presented in the following table:

Receptor	Maximum TRPH Concentration (mg/kg)	FDEP SCTL or CTL (mg/kg)	Hazard Index
Resident	302	340	0.9
Industrial Worker	302	2,500	0.1
Construction Worker	302	490	0.6
Maintenance Worker	302	21,000	0.01
Adolescent Recreational User	302	31,000	0.01
Adult Recreational User	302	40,000	0.008

HIs for all receptors are less than one, indicating adverse non-carcinogenic effects are not anticipated for these receptors under the conditions defined in the exposure assessment.

5.3.3.2 Benzo(a)pyrene

Benzo(a)pyrene was identified as a potential COPC in surface soil. However, benzo(a)pyrene was detected in only one of 16 surface soil samples at a concentration of 43 μg/kg. PAHs are ubiquitous and consistently present in the environment. Literature background concentrations of benzo(a)pyrene ranged to 2,000 μg/kg in natural soils (MADEP, May 2002), 2 to 1,300 μg/kg in rural soils, 4.6 to 900 μg/kg in agricultural soils and from 165 to 220 μg/kg in urban soils (ATSDR, August 1995).

5.3.3.3 Uncertainty Associated with the Size of the Exposure Unit used to Evaluate Exposures to Lead

The entire site (3 acres) was selected as the exposure unit in the evaluation of receptor exposures to lead in the surface soils at Site 11. However, an exposure unit smaller than 3 acres may be plausible. For example, 0.5 acre is sometimes recommended as the size of a residential exposure unit. Depending on the distribution of a contaminant across a site, it is possible for the exposure concentration to vary significantly based on the size of the exposure unit selected for evaluation. Consequently, if elevated concentrations of a contaminant are localized in a small portion of the site, the EPC can be diluted by averaging all samples from across the entire site. However, as previously discussed, lead concentrations were relatively uniform across the site with the exception of a hot spot at location 11-SL-02. As part of the 1999 removal action, additional soil samples were collected in the vicinity of location 11-SL-02 to delineate the extent of the lead contamination. The samples were collected on a grid pattern covering approximately ¼ of an acre. Lead concentrations in this area ranged from 5.2 to 666 mg/kg with an average lead concentration of 128 mg/kg (including the sample from 11-SL-02). This concentration is less than the 400 mg/kg residential screening level and only slightly greater than the arithmetic mean lead concentration of 93 mg/kg for the entire site. Consequently, the size of the exposure unit selected for evaluation did not affect the conclusions of the risk assessment.

5.3.3.4 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for Site 11 were selected using available background concentrations for soil. Aluminum, antimony, arsenic, chromium, iron, manganese, and vanadium in surface soil and aluminum, arsenic, chromium, iron, manganese, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	10,800	19,400	72,000
Antimony	3.5	Not Applicable	26
Arsenic	3.8	5.5	0.8
Chromium	19.6	19.5	210
Iron	11,700	16,800	23,000
Manganese	285	188	1,600
Vanadium	20.3	37.5	15

The SCTLs presented for aluminum, antimony, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-seventh of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-third of the SCTL. The maximum detected concentrations of iron in surface and subsurface soil are roughly one-half of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse non-cancer health effects. The maximum detected concentration of antimony in surface soil is approximately one-seventh of the SCTL. The maximum detected concentration of manganese in surface soil is approximately one-fifth of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-ninth of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 1.3 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 2.5 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentration of arsenic in surface and subsurface soil exceeds the 1×10^{-6} cancer risk levels but not the 1×10^{-5} and 1×10^{-4} risk levels. The maximum detected chromium is approximately one-tenth of the SCTL.

5.3.3.5 Limited Subsurface Soil Dataset

Three subsurface soil samples only were collected during the field investigation at Site 11. However, the subsurface soil samples were collected from test pits excavated at locations where a geophysical anomaly indicated the potential location of buried materials.

5.3.4 Summary and Conclusions

An HHRA was conducted for the chemical concentrations detected in 47 surface soil and three subsurface soil samples collected at Site 11. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation route of exposures. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at the Site 11. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

Several organics [benzo(a)pyrene, 4,4-DDT, alpha chlordane, gamma-chlordane, dieldrin, heptachlor, heptachlor epoxide], lead, and TRPH were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. Two pesticides (aldrin, dieldrin), two PCBs (Aroclor-1254 and Aroclor-1260), and cadmium were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., the HIs) did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although the cancer risk estimate developed for the COPCs for surface soil for one of the five receptors evaluated (the hypothetical future resident) exceeded the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk driver for surface soils was dieldrin; chemical-specific risk estimates for all other COPCs are less than 1×10^{-6}. The risk evaluation of lead concentrations detected in the Site 11 surface soils indicates exposure to average lead concentration in the surface soils would not result in blood lead concentrations exceeding USEPA benchmarks. However, the lead concentration reported for one surface soil location (11-SL-02, 2,230 mg/kg) is five times the USEPA action level for residential land use (400 mg/kg). Extensive surface soil sampling for lead in the immediate vicinity of location 11-SL-02 suggests a very limited area of lead contamination.

The risk assessment conducted using the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Dieldrin	None	None
Lead		

No chemicals were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

The exceedances of SCTLs for the hypothetical future resident exposed to surface soils are primarily associated with samples from location 11-SL-02 (the lead hot spot location) and the confirmation samples associated with the 11-SL-04 removal action. Greater than 50 percent of the estimated cancer risk for the surface soils is attributable to dieldrin. As discussed in Appendix J of the 2000 RI report (Results of Additional Soil Sampling at Site 11, CH2M Hill, February 23, 2000), the surface soil removal action in the vicinity of 11-SL-04 did not result in soils concentrations less than residential SCTLs. However, lead and dieldrin were the only potential COCs detected in surface soils at concentrations exceeding the non-apportioned FDEP SCTLs for residential land use.

5.4 ECOLOGICAL RISK ASSESSMENT

This section presents the results of the ecological risk assessment conducted for surface soil samples collected at Site 11 previously described in Section 5.1. The assessment updates a risk evaluation presented in the 2000 RI report prepared for the U.S. Navy by Harding Lawson Associates. (A copy of the original ecological risk assessment for Site 11 is provided in Appendix C.) This risk assessment was conducted based on current USEPA methodology as detailed in Ecological Risk Assessment for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997). Additional guidance included the Eco Update: The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (USEPA, 2001).

The objective of this ecological risk assessment is to re-evaluate and update the previous ecological risk evaluation for Site 11 to assure compliance with current Navy, USEPA, and State of Florida guidance/methods and, to update any risk assessment results potentially impacting risk management decisions for this site

5.4.1 <u>Initial Screening Evaluation</u>

5.4.1.1 Data for assessment

As discussed in Section 5.3, 36 chemicals were detected in Site 11 surface soils. Table 5-9 illustrates the descriptive statistics for the target analytes detected in samples. The surface soil samples were collected and analyzed as described in Section 5.2.

5.4.1.2 Screening Level Ecological Effects Evaluation

The screening-level effects evaluation establishes constituent exposure levels representing conservative thresholds for adverse ecological effects. The toxicity screening values used in this screening are threshold concentrations below which effects are rare and above which effects are more likely. The screening values are set conservatively to minimize the potential for disregarding potentially significant effects and are used to conduct an initial direct toxicity screening of chemicals concentrations detected in the surface soils.

USEPA Region 4 has published direct toxicity screening values for surface soil based on a literature review by the Westinghouse Savannah River Company, Savannah River Technology Center (Friday, November 1998). USEPA Region 4 screening values are not available for the nutrients calcium, magnesium, potassium, and sodium. These metals are not considered candidates for inclusion as COPCs and are not carried forth in the analysis. They are essential nutrients, are well tolerated, and not toxic except at extremely elevated levels. The screening levels for this assessment are listed in Table 5-9.

In the direct toxicity screening, ecological risk is characterized by comparing maximum concentrations detected in surface soil (Table 5-9) to the USEPA Region 4 screening levels. Chemicals with no screening levels are carried forward in the risk assessment as COPCs. Results are interpreted through the use of the “quotient method”. Hazard quotients (HQs) for direct toxicity screening are calculated by dividing the maximum environmental concentration for each constituent by the corresponding screening value. An HQ less than 1.0 indicates risk is unlikely and no further investigation of the chemical for a particular exposure pathway/medium is warranted.

The results of the direct-toxicity screening for surface soil using maximum concentrations and USEPA Region 4 screening values are illustrated in Table 5-9. Five pesticides (4,4’-DDD, 4,4’-DDE, 4,4’-DDT, total DDT, and dieldrin) and eight metals (aluminum, antimony, chromium, iron, lead, manganese, vanadium, and zinc) are retained as COPCs because the maximum HQ calculated for these chemicals is greater than or equal to 1.0. One VOC (acetone) and one SVOC (bis(2-ethylhexyl)phthalate) are retained as COPCs because USEPA Region 4 screening values are not available. Similarly, four pesticides (alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide) are retained as COPCs in the absence of USEPA Region 4 screening values.

5.4.1.3 Screening Level Food Chain Modeling

In accordance with USEPA Region 4 guidance, bioaccumulative compounds identified as COPCs in the direct toxicity screening level risk calculation (i.e., Table 5-9) were further analyzed in food chain modeling. The USEPA (2000) has published a list of important bioaccumulative compounds. The COPCs on this list are included in the food-chain modeling while those not listed are not. Nine pesticides (4,4’-DDD, 4,4’-DDE, 4,4’-DDT, total DDT (DDTR), dieldrin, alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide) and three metals (chromium, lead and zinc) were evaluated in the food chain model (FCM).

A review of the 2000 RI for Site 11 (Appendix C) indicated the Conceptual Site Model (CSM) and the assessment and measurement endpoints used in the 2000 RI are applicable to the site’s present status.

The guilds selected for food chain modeling in this re-evaluation were based on those modeled in the previous 2000 RI however, the receptors selected for food chain modeling have been modified from those previously evaluated. The receptors for food chain modeling were selected based on the species identified in Tables 4-1 and 4-2 of the Initial Assessment Study of NAS Whiting Field (Envirodyne, May 1985). Modeled receptors included: cotton mouse (mammalian herbivore), short-tailed shrew (mammalian insectivore), bobwhite (avian herbivore), robin (avian insectivore), hawk (avian carnivore), and the gray fox (mammalian carnivore). The only species used in food chain modeling not identified within the Initial Assessment Study is the robin. The robin was selected for inclusion as an insectivore because its body weight to ingestion rate ratio provides a conservative surrogate for risk assessment, and because of its common occurrence in the environment over a broad geographical span. Input for the screening level FCM included maximum concentrations of the bioaccumulative COPCs, and conservative exposure parameters from USEPA's Wildlife Exposure Factors Handbook (USEPA, December 1993). Tables detailing the derivation of exposure factors are included in Appendix C.

Ecotoxicity screening values used in the FCM were based on no observed adverse effect levels (NOAELs) from the literature. The use of NOAELs is appropriate for screening level assessments to ensure risk is not underestimated. Selection of NOAELs from the literature was based on the species tested, the route of exposure, the duration of the study, and the measured effect. Priority was given to studies evaluating ecological effects impacting populations, including adverse effects on development, reproduction, and survival. The toxicity reference values used for each modeled receptor are listed in Appendix C. In the FCM, HQs were calculated by dividing each modeled dose by the corresponding NOAEL. Copies of FCM calculations are included in Appendix C. Table 5-10 illustrates the results of the screening level food chain analysis.

The results of the screening level FCM indicated potential risks to the cotton mouse from lead, to the short-tailed shrew from 4,4'-DDT, dieldrin, heptachlor, and lead, to the bobwhite from lead, to the robin from 4,4'-DDD, DDE, DDT, DDTR, dieldrin, heptachlor, chromium, lead, and zinc, to the hawk from DDTR, and lead, and to the fox from dieldrin and lead. Incidental ingestion of soil and consumption of soil invertebrates appears to contribute the most to potential risks.

5.4.2 <u>Refinement of COPCs</u>

The objective of the refinement step is to better define those constituents potentially contributing unacceptable levels of ecological risk, and to identify and eliminate from further consideration those COPCs initially retained because of the use of very conservative exposure scenarios. The refinement includes consideration of site-specific parameters such as the spatial distribution and frequency of detection of chemicals, receptor home range, constituent bioavailability, and background in defining the constituents of concern (COCs) for the site. Using less conservative assumptions, screening level risk estimates are re-calculated for those constituents identified as COPCs in the screening-level analysis and these new estimates are used to define the list of COCs.

5.4.2.1 Refinement Direct Toxicity Calculation

The direct toxicity screen was recalculated for the COPCs identified in the screening level analysis using arithmetic mean site concentrations. The results of the analysis as illustrated in Table 5-11 show HQs were much lower than those calculated in the screening analysis however, zinc was the only COPC with a HQ less than one when mean concentrations were used. This may indicate several COPC concentrations above the USEPA Region 4 screening levels across the site and/or potential hot spot contribution to elevated concentrations.

5.4.2.2 Refinement Food Chain Model

Refinement food chain modeling was performed for those bioaccumulative constituents identified as food chain COPCs in the screening level food chain model. Mean COPC concentrations and average exposure parameters were used in the refinement FCM. In contrast to the use of exposure parameters that maximized the modeled dose to receptors in the screening level FCM, average exposure parameters (i.e. ingestion rates, body weight) are applied to the same model in the refinement step. Average exposure parameters used in the Refinement FCM were derived from data in the Wildlife Exposure Factors Handbook (USEPA, December 1993) as shown in Appendix C.

In the screening level assessment, a Site Use Factor (SUF) of 1.0 was used indicating the receptor spent 100% of its time at the site (i.e., in the area of maximum contaminant concentration). However, actual exposure will be a function of the home range of the receptor (how large an area the receptor normally covers in its day-to-day activities related to feeding) and the areal extent of contamination. Consequently, in the refinement FCM, SUFs were calculated by dividing the site area by the mean home range of the receptor. Conservatively, a minimum SUF value of 0.1 was used even though several receptors demonstrated much lower SUFs. For those receptors whose home range is less than the area of the site, the SUFs remain equal to one. The SUF was incorporated into the FCM dose calculations to account for differences between site size and receptor home range.

In the refined FCM, estimated doses were compared to NOAEL as well as lowest observed adverse effect levels (LOAELs) to provide a range of risk. NOAEL-based HQs were calculated to estimate the upper bound (more conservative) risk estimate and LOAEL-based HQs were calculated to estimate the lower bound (less conservative) risk estimate. Copies of the refinement FCM calculations are included in Appendix C.

The results of the refinement food chain modeling are illustrated in Table 5-12. The refinement FCM for Site 11 indicated NOAEL-level risk for the shrew from dieldrin. The robin had NOAEL-level risk from the pesticides 4,4'-DDD, 4,4'-DDT, DDTR, heptachlor, and the metals chromium, lead, and zinc. LOAEL-level risk was seen only for the robin from lead. While potential risks are estimated at the NOAEL-level of toxicity, potential risk is not anticipated at the less conservative LOAEL-level of toxicity except for lead in the robin.

5.4.2.3 Spatial Distribution

To assess the spatial extent of potential ecological risk, COPC concentrations at all sampling locations were compared to USEPA Region 4 screening values. For COPCs lacking USEPA Region 4 screening values, conclusions regarding spatial extent of potential risk could not be made. Table 5-13 illustrates the COPCs and the number of locations where concentrations exceeded the applicable USEPA Region 4 screening value. All of the samples analyzed for aluminum, chromium, iron and vanadium (9 of 9) had concentrations in excess of their respective USEPA Region 4 screening levels. The range of HQs were: aluminum (HQs of 52.2 to 216), chromium (HQs of 6.75 to 49), iron (HQs of 7.5 to 58.5), and vanadium (HQs of 2.2 to 10.15). In samples analyzed for pesticides, 4 of 14 had 4,4'-DDE (HQs of 2.1 to 35.2), 7 of 14 had 4,4'-DDT (HQs of 2.7 to 21.2), 8 of 14 had DDTR (HQs of 1.8 to 303.2), and 12 of 14 had dieldrin (HQs of 7 to 420) concentrations above their respective USEPA Region 4 screening values. All samples (11-SL-01 through 11-SL-05, and 11SO01 through 11SO05) included in the 2000 RI had at least one, and at some locations multiple COPCs with concentrations in excess of their respective screening level. This may correspond to a large portion of the 3-acre site having potential risk to soil invertebrates and plants. 4,4'-DDD, antimony, and zinc exceeded their respective USEPA Region 4 screening levels at only one location (11-SL-02) indicating potential risks may be localized.

Lead exceeded its screening level in 10 of 47 samples analyzed. Sample location 11-SL-02 had the highest lead concentration at Site 11 (2230 mg/kg). Lead concentrations at sample locations 11SO2601 (161 mg/kg) and 11SO3901 (180 mg/kg) also exceeded the USEPA Region 4 screening values. It appears all three of these samples were collected from the same location but during two different sampling events (1992 and 1999). 11SO3901 is a duplicate sample for 11SO2601. The similarity in concentration between these two samples calls in question whether the reported concentration of 2230 mg/kg for sample 11-SL-02 is an outlier. Comparison to lead concentrations at other sample locations across the site appears to indicate lower lead concentrations (161 and 180 mg/kg) may be more consistent with site conditions. All adjacent sample locations to the north, south, east, and west of samples 11-SL-02, 11SO3901, and 11SO2601 had lead concentrations less than the USEPA Region 4 screening level.

Potential risk associated with lead appears to be isolated primarily to location 11-SL-02 with HQs (excluding the 11-SL-02 result) of no more than 3.6 for other locations. Three samples in the southwest corner of Site 11 (11SO2901, 11SO3401, and 11SO3501) had lead concentrations in excess of the USEPA Region 4 screening level. The maximum affected area is estimated to be 0.014 acre with a maximum HQ associated with these three samples of 2.5. Lead concentrations reported for samples adjacent to these locations were less than the screening level. Three samples in the northwest corner of Site 11 (11SO1401, 11SO1501, and 11SO2001) had lead concentrations in excess of the USEPA Region 4 screening level. The maximum affected area is estimated to be 0.014 acre with a maximum HQ associated with these three samples of 2.1. Lead concentrations reported for samples adjacent to these locations were less than the screening level. The one remaining location (11SO3801) with a lead concentration greater than the USEPA Region 4 screening level is located on the southeast portion of the site. The HQ for this location is 13.3 however, all adjacent sample locations had lead concentrations less than the screening level indicating a localized potential risk.

As part of the evaluation of spatial distribution, an analysis of the locations of maximum detected concentrations was also performed to identify potential hot spots at Site 11. The results of this analysis indicated a potential hotspot is present at sample location 11-SL-02 where 13 of 19 COPCs retained following screening level analysis (acetone, 4,4’-DDD, DDE, DDT, DDTR, dieldrin, aluminum, antimony, chromium, iron, lead, vanadium, zinc) had their maximum concentrations. For comparison, sample location 11SO4801 had the next highest number of maximum concentrations (4) for the compounds alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide initially retained as COPCs. To ascertain the potential impacts of sample location 11-SL-02 upon direct toxicity and food chain risks, the direct toxicity and food chain analyses were re-run without data for the sample location included in the analysis. The results, as illustrated in Tables 5-14 and 5-15, indicated a decrease in the HQs for direct toxicity with zinc having an HQ less than 1.0, and a reduction in food chain risk with only the robin having NOAEL-level risk for chromium and lead. Based on this analysis, it appears sample location 11-SL-02 is a hotspot and contributes a high level to the overall site risk.

5.4.2.4 Frequency of Detection and Detection Limits

The COPCs acetone, 4,4’-DDD, antimony, and zinc were detected in only one sample, 11-SL-02. The potential ecological risk associated with these COPCs is therefore localized and not site-wide. The COPC zinc, while detected in 9-of-9 samples, had only one sample with a concentration greater than its USEPA Region 4 screening level (sample 11-SL-02). Potential risk from zinc is also localized and does not appear to be a site-wide concern. Phthalates are common laboratory contaminants; hence low detections in environmental samples might not reflect site contamination. The reported maximum concentration for bis(2-ethylhexyl)phthalate (130 µg/Kg) was less than the lowest reported non-detected concentration of 350 µg/Kg suggesting the detection of this SVOC might be attributable to laboratory contamination.

5.4.2.5 Bioavailability

To assess the potential bioavailability of Site 11 COPCs, total organic carbon (TOC) and pH data for site surface soil was researched. No TOC data was found in the analytical data in Appendix C of the Site 11 2000 RI. In the absence of TOC data, potential effects on bioavailability from adsorption to organic carbon could not be assessed.

Data on surface soil pH was found in the document: Toxicity Analysis of Soil Samples From NAS Whiting Field Milton, Florida (ESE, August 1996). The average pH was 6.25 in Site 11 surface soils submitted for toxicity testing. Based on the measured soil pH, aluminum and iron are not anticipated to be toxic to plants or invertebrates. According to the Ecological Soil Screening Level (Eco-SSL) developed by the USEPA for aluminum (USEPA, November 2003a), aluminum is only identified as a COPC at sites where the soil pH is less than 5.5. The Eco-SSL for iron states that iron is not expected to be toxic in soils with a pH between 5 and 8 (USEPA, November 2003b). Evaluation of total metal concentrations does not accurately reflect the biologically available fraction (NFESC, July 2000). Metals in soils may become less bioavailable over time, which is consistent with natural attenuation mechanisms. Studies have shown metals originally sorbed to the soil surface can migrate to internal sites within the soil structure resulting in metals being less chemically labile and thus less bioavailable. Consequently, the bioavailability of metals in the environment is typically less than found in experimentally administered media. The amount of metal desorbed from food or from incidentally ingested soils is dependent on numerous factors such as pH and chemical form (soluble-insoluble).

In general, the chlorinated pesticides are very persistent and remain bioavailable to soil invertebrates and plants (Verma and Pillai 1991). The pesticides' bioavailability to plants and invertebrates indicates potential bioavailability to the vertebrate receptors consuming the plants and invertebrates. In the absence of site-specific data to indicate otherwise, pesticides are presumed to be bioavailable to plants and invertebrates, and to vertebrate receptors.

VOCs detected in soils are anticipated to be biodegraded or volatilize to the atmosphere and not available for exposure of potential ecological receptors. Phthalates adhere strongly to organic matter in soil. However, due to their limited mobility in soil, the overall implication is that phthalates are not highly available.

5.4.2.6 Comparison to Background

To distinguish between the potential ecological risk associated with Site 11 surface soils and the risk contributed by background concentrations of COPCs, a comparison between site concentrations and background concentrations was performed. Appendix A contains details on the background comparison methodology and results. Table 5-16 summarizes the results of the comparison for Site 11. As can be seen, no background data was available for pesticides, so they remain as COPCs for Site 11. For metals, only lead and zinc had site concentrations greater than background. The individual metal constituents aluminum, iron, manganese, and vanadium have no direct evidence of site-related use at Site 11 and the process and procedures at this site did not likely contribute to the presence of these inorganic analytes in surface or subsurface soil. Additionally, the site-specific values for these inorgancs are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field," presenting the technical basis for this determination. Considering the information presented above, aluminum, iron, manganese, and vanadium are not considered COPCs for Site 11 surface and subsurface soils.

5.4.2.7 Comparison to Various Surface Soil Guidelines

For those COPCs with site concentrations greater than background (pesticides, lead, zinc), a comparison was performed with various soil guidelines to assist in the identification of COPCs contributing the greatest potential ecological risk at Site 11. Ecological soil guidelines were obtained from the same source document used to develop the USEPA Region 4 screening values (Friday, November 1998). The soil guidelines used in the comparison included United States Fish and Wildlife Service [USFWS (Beyer 1990)], Oak Ridge National Laboratory [ORNL(Efroymson et al. 1997a,b)], the Dutch (MVROM, 2000)., and Canadian (CCME 1997 updated 1999) values. The Dutch and Canadian values have been updated since 1998 so values from the original source document (Friday, November 1998) were also updated as appropriate.

The USFWS (Beyer, 1990) values include two categories. Category A refers to background concentrations in soil or detection limits, and category B refers to moderate soil contamination requiring additional study. ORNL identified soil values specific to Department of Energy sites for the protection of soil invertebrates, microbial processes and terrestrial plants. The Canadian Council of Ministers of the Environment (CCME) guidelines were derived specifically for the protection of ecological receptors in the environment or for the protection of human health associated with agricultural, residential/parkland, commercial, and industrial land use types. The Dutch target values indicate the soil quality required for sustainability or, expressed in terms of remedial policy, the soil quality required for the full restoration of the soil's functionality for human, animal, and plant life. The Dutch intervention values, indicate the concentration levels of the contaminants in the soil above which the functionality of the soil for human, plant, and animal life is seriously impaired or threatened.

Table 5-17 compares the maximum and mean COPC concentrations with the above-referenced soil guidelines. As ORNL values are available only for lead and zinc, they were not included in the table but are discussed below.

No screening value was available for acetone from the cited sources. Bis(2-ethylhexyl)phthalate exceeded the lowest guideline (Dutch Target) in just one location. This indicates the potential ecological risk from bis(2-ethylhexyl)phthalate may be isolated and does not represent a site-wide concern.

4,4'-DDD exceeded the lowest guideline (Beyer A) at one location (11-SL-02), 4,4'-DDE did not exceed any guideline, and 4,4'-DDT exceeded the Beyer A and B guidelines at 1 of 14 locations (11-SL-02). Total DDT exceeded the lowest guideline (Dutch Target) at 6 of 14 locations which is similar to the result (8 of 14 locations) when compared to the USEPA Region 4 screening level. When compared to the higher CCME guideline, total DDT exceeded it at only one location (11-SL-02). These results indicate that while sample location 11-SL-02 appears to be a hotspot containing the majority of elevated 4,4'-DDD, DDE, and DDT concentrations, potential risk from exposure to these compounds as represented by total DDT encompasses a larger area.

The lowest guideline for dieldrin (Dutch Target) is the same as the USEPA Region 4 screening values so the results (12 of 14 samples exceeded the guideline) are the same. When compared to the next highest guideline (Beyer's A value) dieldrin concentrations exceeded it in two locations.

Alpha and gamma-chlordane exceeded the lowest guideline (Dutch Target) in 10 of 14 locations. They also exceeded the next highest guideline (Beyer A value) in 5 of 14 locations. This indicates the potential risk from exposure to chlordane may not be localized.

Heptachlor exceeded the lowest guideline (Dutch Target) at two locations and exceeded the next highest guideline (Beyer A) at one location. Heptachlor epoxide exceeded the lowest guideline (Dutch Target) in 7 of 14 locations indicating an extended area of potential risk, but was below all of the other guidelines. As previously mentioned, sample 11SO4801 was the location of maximum concentrations for alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide and may represent a localized hotspot for these pesticides. An area of chlorinated pesticide contamination may be bounded by sample locations 11-SL-02, 11-SL-05, 11-SL-03, and 11S0001 representing approximately 0.63 acre.

Lead concentrations exceeded the lowest guidelines (ORNL phytotoxicity, Beyer A) in 10 of 47 samples. The Dutch Target value was exceeded in 8 of 47 samples and the CCME and Beyer B values in 5 of 47 samples. These findings are in agreement with the results of the comparison to the USEPA Region 4 screening value and the conclusion the potential ecological risk from lead is associated with limited areas of the site. These areas include the southwest corner of Site 11 (samples 11SO2901, 11SO3401, and 11SO3501), the northwest corner of the site (samples 11SO1401, 11SO1501, and 11SO2001), the center of the site (samples 11-SL-02, 11SO2601, 11SO3901) and one other isolated location (11SO3801). As previously indicated, all adjacent sample locations to the north, south, east, and west of these locations had lead concentrations below all of the cited guidelines.

Zinc exceeded the ORNL, Beyer A, CCME, and Dutch Target guidelines in only one sample (11-SL-02). As with the USEPA Region 4 screening value, all other sample locations had concentrations less than the guideline consequently, potential risk from zinc appears to be localized.

Comparisons of soil concentrations to guidelines other than USEPA Region 4 values corroborates the presence of areas of potential risk to soil invertebrates and plants. Sample location 11-SL-02 appears to be a hotspot for several chemicals with concentrations exceeding both the USEPA Region 4 screening values and the other cited soil guidelines. Table 5-18 provides a summary of the COPCs and rationale for their selection following refinement analyses.

5.4.3 <u>Soil Toxicity Testing</u>

To evaluate potential effects of site contamination on soil invertebrates and plant life, toxicity testing was performed as described in the 2000 RI (see Appendix C). The toxicity tests were performed by Environmental Science and Engineering using earthworms and lettuce seeds as the test organisms. Samples submitted for toxicity testing included: 11S00201, 11S00301, 11S00401, and 11S00501. A review of the toxicity testing report (ESE, 1996) indicated appropriate testing and quality control/quality assurance methodologies were used. Based on the results of the toxicity testing, the 2000 RI concluded: “with the exception of soil at location 11SOO201, the contamination present in surface soil at Site 11 does not present an unacceptable risk for terrestrial soil invertebrates". The 2000 RI concluded toxicity at sample location 11SOO201 was associated with elevated concentrations of DDT and total petroleum hydrocarbons (TPH). The 2000 RI further concluded: “The results of the toxicity testing show surface soil samples collected at Site 11 are not expected to impact the survival and growth of terrestrial plants”. A review of the samples analyzed and the test organisms evaluated identified several uncertainties with these conclusions. Specifically:

- No rationale was given in the 2000 RI regarding selection of sample locations to be submitted for toxicity testing.

- Toxicity testing was not performed on samples with the highest historical contaminant concentrations consequently potential toxicity may be underestimated.

- The toxicity of DDT to earthworms is low (Edwards and Bohlen 1992), so it is possible another contaminant is associated with earthworm toxicity at location 11SOO201. No other contaminants were identified in this sample at concentrations greater than those found in samples with no earthworm toxicity.

The 2000 RI conclusions regarding an absence of potential risk to soil invertebrates and plants across Site 11 may underestimate potential risks to soil invertebrates and plants. Conclusions may be made regarding the presence or absence of toxicity at the sample locations included in the testing; however, conclusions regarding all of Site 11 are not applicable since toxicity testing was not performed on samples with the highest historical contaminant concentrations.

5.4.4 Uncertainties

A discussion of uncertainties associated with ecological risk assessment was included in the 2000 RI and the companion General Information Report. While the uncertainty discussions in these documents adequately addressed general uncertainties in ecological risk assessment, the following uncertainties were identified specific to Site 11 and the re-evaluation analyses.

- There is uncertainty in applying literature soil screening values due to potential differences in soil composition between Site 11 and those used in the cited studies. For example, the Dutch values are based on a standard soil containing 10 percent organic matter and 25 percent clay while the specific organic matter percentage in Site 11 soils is not known. The potential for underestimating risk may be reduced however through the use of the lowest applicable value for each COPC.

- There is uncertainty in conclusions based on the results of the soil toxicity testing. Uncertainties associated with selection of sample locations for testing, not testing locations with the highest contaminant concentrations, and possible misinterpretation of earthworm testing results may lead to an underestimate of potential risks to soil invertebrates and plants.

- There is uncertainty regarding the source of chlorinated pesticides at Site 11. If the source of the pesticides is historic basewide application, then potential risk specifically attributed to site-related activities at Site 11 may be overestimated.

5.4.5 Conclusions

The 2000 RI ecological risk assessment performed for Whiting Field Site 11 has been re-evaluated and updated to reflect current USEPA and US Navy guidance. The following conclusions have been made based on the results of the re-evaluation:

- COPCs identified at Site 11 during screening level analyses include pesticides, lead, and zinc.

- A large portion of the soil samples at Site 11 exceed the USEPA Region 4 screening levels indicating areas of potential risk to soil invertebrates and plants at the three acre site. However, comparisons of soil concentrations to guidelines other than USEPA Region 4 values suggest areas of potential impact to soil invertebrates and plants may be limited and not site-wide.

- Spatial analyses indicated potential risk from pesticides cover an approximate area of 0.63 acre.

- Spatial analyses indicated potential risk from lead appears to be present at the southwest corner, northwest corner, the center of the site and at one isolated sample location in the southeastern portion of the site.

- Spatial analysis indicated potential risk from zinc was isolated to one sample location and does not represent a site-wide risk.

- Food chain modeling for Site 11 indicated NOAEL-level risk for the shrew and robin from pesticides and metals. LOAEL-level risk was seen only for the robin (lead).

- A hot-spot appears to be present at Site 11 at sample location 11-SL-02 (pesticides, lead, zinc).

- A smaller hotspot containing organochlorinated pesticides may be present at sample location 11SO4801.

- The exclusion of analytical data for sample location 11-SL-02 from the direct-toxicity and food chain analyses resulted in a reduction in direct-toxicity HQ values and no LOAEL-level risk for the robin.

- Soil toxicity testing reported in the 2000 RI was not performed at the locations of highest contamination. The conclusion in the 2000 RI based on soil toxicity testing regarding absence of site-wide potential risk to plants and soil invertebrates does not appear applicable.

5.4.6 **Summary**

A screening level ecological risk assessment including Step 3A has been completed for surface soil at Whiting Field Site 11. Following an initial screening step where maximum site concentrations of contaminants were compared to conservative screening values, a list of COPCs was developed. COPCs consisted of pesticides and metals. One VOC and one SVOC were also retained as COPCs in the absence of applicable screening values. Bioaccumulative COPCs were analyzed in a food chain model to evaluate potential risks associated with consumption of contaminated food. The results of the food chain model indicated potential risks were primarily limited to lead. The list of COPCs was refined through an evaluation of spatial distribution, frequency of detection and detection limits, receptor home range, constituent bioavailability, and background. Additionally, COPC concentrations were compared to a variety of soil guidelines to reduce the uncertainty associated with using very conservative screening values, and to assist in characterizing spatial distribution of potential risk. The results of the refinement analyses indicated chlorinated pesticides, lead and zinc contribute the most to site-related risk. Sample 11SO4801 may represent a localized area of elevated risk from alpha-chlordane, gamma-chlordane, heptachlor, and heptachlor epoxide. An approximately 0.63 acre area of chlorinated pesticide contamination may be present bounded by sample locations 11-SL-02, 11-SL-05, 11-SL-03, and 11S0001. The analyses indicated the highest level of potential risk appears to be in the vicinity of sampling location 11-SL-02. This location contained elevated concentrations of multiple COPCs including chlorinated pesticides, lead, and zinc.

TABLE 5-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
67-64-1	ACETONE	1/9	0.1 J	0.1 J	0.011 - 0.012	11-SL-02	0.1	NA (13)	1600	N	160	780	N	11000	Kidney, Liver, Neurological	130	1.3E-04	No	BSL
	Semivolatile Organics (mg/kg)																		
50-32-8	CARCINOGENIC PAHS	1/16	0.043	0.043	0.01 - 0.4	11SS4703	0.043	NA	0.062	C	0.004	0.1	C	0.1	---	0.008	4.3E-01	Yes	ASL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/9	0.052 J	0.13 J	0.35 - 4	11SO0201	0.13	NA	35	C	2.5	76	C	72	---	6	1.7E-03	No	BSL
	Pesticides PCBs (mg/kg)																		
72-54-8	4,4'-DDD	1/9	0.14 J	0.14 J	0.0036 - 0.68	11-SL-02	0.14	NA	2.4	C	0.2	4.6	C	4.2	---	0.4	3.0E-02	No	BSL
72-55-9	4,4'-DDE	6/14	0.0021	0.088 J	0.0035 - 0.14	11-SL-02	0.088	NA	1.7	C	0.1	3.3	C	2.9	---	0.3	2.7E-02	No	BSL
50-29-3	4,4'-DDT	8/14	0.0023	0.53 J	0.0035 - 0.14	11-SL-02	0.53	NA	1.7	C	0.1	3.3	C	2.9	---	0.3	1.6E-01	Yes	ASL
309-00-2	ALDRIN	1/9	0.00096 J	0.00096 J	0.0019 - 0.49	11SO0201	0.00096	NA	0.029	C	0.002	0.07	C	0.06	---	0.005	1.4E-02	No	BSL
5103-71-9	ALPHA-CHLORDANE	8/14	0.0208	0.549	0.0019 - 0.18	11SO4801	0.549	NA	1.6	C	0.11	3.1	C	---	---	0.2	1.8E-01	Yes	ASL
60-57-1	DIELDRIN	12/14	0.0035	0.21 J	0.0037 - 0.018	11-SL-02	0.21	NA	0.03	C	0.002	0.07	C	0.06	---	0.005	3.0E+00	Yes	ASL
5103-74-2	GAMMA-CHLORDANE	8/14	0.0166	0.678	0.0019 - 0.18	11SO4801	0.678	NA	1.6	C	0.11	3.1	C	---	---	0.2	2.2E-01	Yes	ASL
76-44-8	HEPTACHLOR	2/14	0.0048 J	0.139	0.0018 - 0.49	11SO4801	0.139	NA	0.11	C	0.008	0.2	C	0.2	---	0.02	7.0E-01	Yes	ASL
1024-57-3	HEPTACHLOR EPOXIDE	5/14	0.0011 J	0.0626 J	0.0018 - 0.49	11SO4801	0.0626	NA	0.053	C	0.004	0.1	C	0.1	---	0.008	6.3E-01	Yes	ASL
	Inorganics (mg/kg)													0					
7429-90-5	ALUMINUM	9/9	2110	10800	---	11-SL-01-D, 11-SL-02	10800	no	76000	N	7600	72000	N	80000	Body Weight	24000	1.5E-01	No	BKG
7440-36-0	ANTIMONY	1/9	3.5 J	3.5 J	2.6 - 12	11-SL-02	3.5	no	31	N	3.1	26	N	27	Blood, Mortality	8.7	1.3E-01	No	BKG
7440-38-2	ARSENIC	9/9	0.93 J	3.8	---	11-SL-02	3.8	no	0.39	C	0.028	0.8	C	2.1	---	0.062	4.8E+00	No	BKG
7440-39-3	BARIUM	9/9	4.6 J	96	---	11-SL-02	96	yes	5400	N	540	110	N	120	Cardiovascular	110	8.7E-01	No	BSL
7440-41-7	BERYLLIUM	7/9	0.05 J	0.14 J	0.05	11-SL-02	0.14	NE (14)	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.2E-03	No	BSL
7440-43-9	CADMIUM	2/9	0.24 J	0.28 J	0.58 - 1	11SO0201	0.28	NE	37	N	3.7	75	N	82	Kidney	75	3.7E-03	No	BSL
7440-70-2	CALCIUM	9/9	183 J	1790	---	11-SL-02	1790	NE	---		---	---		---	---	---		No	NUT
7440-47-3	CHROMIUM	9/9	2.7	19.6	---	11-SL-02	19.6	no	210	C	15	210	C	210	---	16.2	9.3E-02	No	BKG
7440-48-4	COBALT	5/9	0.94 J	3.4 J	0.33 - 10	11-SL-02	3.4	NE	900	C	64	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	783	7.2E-04	No	BSL
7440-50-8	COPPER	7/9	3.7 J	19.4	5	11-SL-02	19.4	yes	3100	N	310	110	N	150	Gastrointestinal	110	1.8E-01	No	BSL
7439-89-6	IRON	9/9	1500	11700	---	11-SL-02	11700	no	23000	N	2300	23000	N	53000	Blood, Gastrointestinal	7670	5.1E-01	No	BKG
7439-92-1	LEAD	47/47	5.2	2230	---	11-SL-02	2230	yes	400		400	400		400	---	400	5.6E+00	Yes	ASL
7439-95-4	MAGNESIUM	9/9	54.2 J	1260	---	11-SL-02	1260	NE	---		---	---		---	---	---		No	NUT
7439-96-5	MANGANESE	9/9	31.4	285	---	11-SL-01-D	285	no	1800	N	180	1600	N	3500	Neurological	267	1.8E-01	No	BKG
7439-97-6	MERCURY	5/9	0.04 J	0.08	0.1	11SO0501	0.08	NE	23	N	2.3	3.4	N	3	Neurological	0.57	2.4E-02	No	BSL
7440-02-0	NICKEL	4/9	1.6 J	10	2.3 - 8	11-SL-02	10	NE	1600	N	160	110	N	340	Body Weight	110	9.1E-02	No	BSL
7440-09-7	POTASSIUM	8/9	62.1 J	166 J	132	11-SL-02	166	NE	---		---	---		---	---	---		No	NUT
7782-49-2	SELENIUM	1/9	0.16 J	0.16 J	0.45 - 1	11SO0101	0.16	NE	390	N	39	390	N	440	Hair Loss, Neurological, Skin	65	4.1E-04	No	BSL
7440-22-4	SILVER	4/9	0.55 J	1.9 J	2	11-SL-02	1.9	NE	390	N	39	390	N	410	Skin	195	4.9E-03	No	BSL
7440-23-5	SODIUM	9/9	160 J	307 J	---	11-SL-02	307	NE	---		---	---		---	---	---		No	NUT
7440-62-2	VANADIUM	9/9	4.4 J	20.3	---	11-SL-02	20.3	no	550	N	55	15	N	67	NOEL	15	1.4E+00	No	BKG
7440-66-6	ZINC	9/9	5.7	260	---	11-SL-02	260	NE	23000	N	2300	23000	N	26000	Blood	7670	1.1E-02	No	BSL
	Miscellaneous Parameter (mg/kg)																		
57-12-5	CYANIDE	5/9	0.09 J	0.19 J	0.24 - 0.27	11SO0201	0.19	NA	1200	N	120	30	N	34	Body Weight, Neurological, Thyroid	30	6.3E-03	No	BSL
	Petroleum Hydrocarbons (mg/kg)																		
TTNUS001	TRPH	7/7	7	302 J	---	11SS4701	302	NA	---		---	340	N	460	Multiple endpoints	170	8.9E-01	Yes	ASL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 5-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 14 chemicals detected in surface soil at Site 11. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 14. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 13 carcinogens were detected in surface soil at Site 11. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 13. For noncarcinogens, neurological effects were identified as the target organ for 6 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 6. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

11-SL-01	11SO0301	11SO0801	11SO1401	11SO2001	11SO2501	11SO3001	11SO3601	11SO4301	11SO4901-D
11-SL-01-AVG	11SO0401	11SO0901	11SO1501	11SO2101	11SO2601	11SO3101	11SO3701	11SO4401	11SO5001
11-SL-01-D	11SO0501	11SO1001	11SO1601	11SO2201	11SO2601-AVG	11SO3201	11SO3801	11SO4401-AVG	11SO5101
11-SL-02	11SO0601	11SO1101	11SO1701	11SO2201-AVG	11SO2601-D	11SO3301	11SO4101	11SO4401-D	11SS4701
11-SL-03	11SO0601-AVG	11SO1201	11SO1801	11SO2201-D	11SO2701	11SO3401	11SO4201	11SO4501	11SS4702
11-SL-05	11SO0601-D	11SO1301	11SO1901	11SO2301	11SO2801	11SO3501		11SO4801	11SS4703
11SO0101	11SO0701			11SO2401	11SO2901			11SO4901	
11SO0201								11SO4901-AVG	

TABLE 5-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
Volatile Organics (mg/kg)																			
67-64-1	ACETONE	2/3	0.08 J	0.1 J	0.019	11SS0101	0.1	NA (13)	1,600	N	160	780	N	11,000	Kidney, Liver, Neurological	110	1.3E-04	No	BSL
108-88-3	TOLUENE	1/3	0.004 J	0.004 J	0.011 - 0.012	11SS0101	0.004	NA	520	sat	520	380	N	7,500	Kidney, Liver, Neurological	54	1.1E-05	No	BSL
1330-20-7	TOTAL XYLENES	3/3	0.004 J	0.008 J	---	11SS0303	0.008	NA	270	N	27	5,900	N	130	Body Weight, Mortality, Neurological	840	1.4E-06	No	BSL
Semivolatile Organics (mg/kg)																			
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/3	0.1 J	0.1 J	0.37 - 4	11SS0101	0.1	NA	35	C	3.2	76	C	72	---	8	1.3E-03	No	BSL
Pesticides PCBs (mg/kg)																			
72-54-8	4,4'-DDD	2/3	0.022 J	0.12	0.0037	11SS0303	0.12	NA	2.4	C	0.2	4.6	C	4.2	---	0.5	2.6E-02	No	BSL
72-55-9	4,4'-DDE	3/3	0.005 J	0.027	---	11SS0202	0.027	NA	1.7	C	0.2	3.3	C	2.9	---	0.3	8.2E-03	No	BSL
50-29-3	4,4'-DDT	2/3	0.0084	0.028 J	0.0076	11SS0303	0.028	NA	1.7	C	0.2	3.3	C	2.9	---	0.3	8.5E-03	No	BSL
309-00-2	**ALDRIN**	1/3	0.007 J	0.007 J	0.0019 - 0.021	11SS0101	0.007	NA	0.029	C	**0.003**	0.07	C	0.06	---	0.007	1.0E-01	**Yes**	**ASL**
11097-69-1	**AROCLOR-1254**	1/3	0.26 J	0.26 J	0.037 - 0.4	11SS0101	0.26	NA	0.22	C	**0.02**	0.5	C	0.5	---	**0.05**	5.2E-01	**Yes**	**ASL**
11096-82-5	**AROCLOR-1260**	1/3	0.062 J	0.062 J	0.037 - 0.4	11SS0101	0.062	NA	0.22	C	**0.02**	0.5	C	0.5	---	**0.05**	1.2E-01	**Yes**	**ASL**
60-57-1	**DIELDRIN**	3/3	0.002 J	0.033 J	---	11SS0303	0.033	NA	0.03	C	**0.003**	0.07	C	0.06	---	**0.007**	4.7E-01	**Yes**	**ASL**
Inorganics (mg/kg)																			
7429-90-5	ALUMINUM	3/3	11300	19400	---	11SS0202	19400	no	76,000	N	**7600**	72,000	N	80,000	Body Weight	24000	2.7E-01	No	BKG
7440-38-2	ARSENIC	3/3	3.7	5.5	---	11SS0202	5.5	no	0.39	C	**0.035**	0.8	C	2.1	---	**0.08**	**6.9E+00**	No	BKG
7440-39-3	BARIUM	3/3	10.7 J	28.5 J	---	11SS0303	28.5	NE (14)	5,400	N	540	110	N	120	Cardiovascular	110	2.6E-01	No	BSL
7440-41-7	BERYLLIUM	3/3	0.12 J	0.21 J	---	11SS0202	0.21	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.8E-03	No	BSL
7440-43-9	**CADMIUM**	2/3	5	6.5	0.67	11SS0303	6.5	yes	37	N	**3.7**	75	N	82	Kidney	75	8.7E-02	**Yes**	**ASL**
7440-70-2	CALCIUM	3/3	601 J	12100	---	11SS0303	12100	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	CHROMIUM	3/3	11.4	19.5	---	11SS0101	19.5	no	210	C	**19**	210	C	210	---	21	9.3E-02	No	BKG
7440-48-4	COBALT	3/3	1.1 J	1.7 J	---	11SS0303	1.7	NE	900	C	82	4,700	N	1,700	Cardiovascular, Immunological, Neurological, Reproductive	671	3.6E-04	No	BSL
7440-50-8	COPPER	3/3	5.9	17.2	---	11SS0101	17.2	NE	3,100	N	310	110	N	150	Gastrointestinal	110	1.6E-01	No	BSL
7439-89-6	IRON	3/3	7780	16800	---	11SS0101	16800	no	23,000	N	**2300**	23,000	N	53,000	Blood, Gastrointestinal	**7670**	7.3E-01	No	BKG
7439-92-1	LEAD	3/3	7.4	109	---	11SS0303	109	NE	400		400	400		400	---	400	2.7E-01	No	BSL
7439-95-4	MAGNESIUM	3/3	85.2 J	311 J	---	11SS0303	311	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	3/3	20.6	188	---	11SS0303	188	no	1,800	N	**180**	1,600	N	3,500	Neurological	229	1.2E-01	No	BKG
7439-97-6	MERCURY	3/3	0.08 J	0.2 J	---	11SS0303	0.2	NE	23	N	2.3	3.4	N	3	Neurological	0.49	5.9E-02	No	BSL
7440-02-0	NICKEL	3/3	3.5 J	3.9 J	---	11SS0303	3.9	NE	1600	N	160	110	N	340	Body Weight	110	3.5E-02	No	BSL
7782-49-2	SELENIUM	1/3	0.56 J	0.56 J	0.48 - 0.5	11SS0202	0.56	NE	390	N	39	390	N	440	Hair Loss, Neurological, Skin	55.7	1.4E-03	No	BSL
7440-23-5	SODIUM	3/3	167 J	189 J	---	11SS0303	189	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	3/3	22.2	37.5	---	11SS0202	37.5	no	550	N	55	15	N	67	NOEL	**15**	2.5E+00	No	BKG
7440-66-6	ZINC	3/3	12.8 J	298	---	11SS0101	298	NE	23,000	N	2300	23,000	N	26,000	Blood	11500	1.3E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 5-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 11 chemicals detected in subsurface soil at Site 11. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 11. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens by Chapter 62-777 F.A.C. For example, 10 carcinogens were detected in subsurface soil at Site 11. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 10. For noncarcinogens, neurological effects were identified as the target organ for 7 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 7. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
11SS0101
11SS0202
11SS0303

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 5-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	3E-06	- -	- -	Dieldrin	0.1	- -
	Subsurface Soil	1E-06	- -	- -	- -	0.3	- -
Industrial Workers	Surface Soil	8E-07	- -	- -	- -	0.01	- -
	Subsurface Soil	3E-07	- -	- -	- -	0.03	- -
Construction Workers	Surface Soil	2E-07	- -	- -	- -	0.04	- -
	Subsurface Soil	1E-07	- -	- -	- -	0.1	- -
Maintenance Workers	Surface Soil	2E-07	- -	- -	- -	0.001	- -
Adolescent Recreational Users	Surface Soil	3E-07	- -	- -	- -	0.005	- -
Adult Recreational Users	Surface Soil	3E-07	- -	- -	- -	0.002	- -
Lifelong Recreational Users	Surface Soil	5E-07	- -	- -	- -	NA	- -

Notes:
NA - Not applicable.
HI - Hazard Index.

TABLE 5-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
67-64-1	ACETONE	0.1 J	0.1	780 N	1.3E-04	NA (6)	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
50-32-8	BENZO(A)PYRENE	0.043	0.043	0.1 C	4.3E-01	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.13 J	0.13	76 C	1.7E-03	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.14 J	0.14	4.6 C	3.0E-02	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.088 J	0.04	3.3 C	2.7E-02	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.53 J	0.3	3.3 C	1.6E-01	NA	No	maximum < SCTL
309-00-2	ALDRIN	0.00096 J	0.00096	0.07 C	1.4E-02	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.549	0.2	3.1 C	1.8E-01	NA	No	maximum < SCTL
60-57-1	**DIELDRIN**	0.21 J	0.1	0.07 C	**3.0E+00**	NA	**Yes**	maximum > SCTL
5103-74-2	GAMMA-CHLORDANE	0.678	0.2	3.1 C	2.2E-01	NA	No	maximum < SCTL
76-44-8	HEPTACHLOR	0.139	0.08	0.2 C	7.0E-01	NA	No	maximum < SCTL
1024-57-3	HEPTACHLOR EPOXIDE	0.0626 J	0.06	0.1 C	6.3E-01	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	10800	10800	72000 N	1.5E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	3.5 J	3.5	26 N	1.3E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.8	3.8	0.8 C	**4.8E+00**	no	No	(8)
7440-39-3	BARIUM	96	96	110 N	8.7E-01	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.14	120 N	1.2E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	0.28 J	0.28	75 N	3.7E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	1790	1790	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	19.6	19.6	210 C	9.3E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	3.4 J	3.4	4700 N	7.2E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	19.4	19.4	110 N	1.8E-01	yes	No	maximum < SCTL
7439-89-6	IRON	11700	11700	23000 N	5.1E-01	no	No	(8)
7439-92-1	**LEAD**	2230	93.1	400	**5.6E+00**	yes	**Yes**	maximum >3 X SCTL
7439-95-4	MAGNESIUM	1260	1260	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	285	285	1600 N	1.8E-01	no	No	(8)
7439-97-6	MERCURY	0.08	0.08	3.4 N	2.4E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	10	10	110 N	9.1E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	166 J	166	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.16 J	0.16	390 N	4.1E-04	NE	No	maximum < SCTL
7440-22-4	SILVER	1.9 J	1.9	390 N	4.9E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	307 J	307	---	---	NE	No	Essential Nutrient

TABLE 5-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7440-62-2	VANADIUM	20.3	20.3	15 N	**1.4E+00**	no	No	(8)
7440-66-6	ZINC	260	260	23000 N	1.1E-02	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.19 J	0.19	30 N	6.3E-03	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	TRPH	302 J	302	340 N	8.9E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 11 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

9 The arithmetic mean lead concenetration is less than the 400 mg/kg SCTL. Therefore, lead is not selected as a potential COC.

TABLE 5-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 3 OF 3

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Associated Samples:

11-SL-01	11SO1001	11SO2501	11SO4201
11-SL-01-AVG	11SO1101	11SO2601	11SO4301
11-SL-01-D	11SO1201	11SO2601-AVG	11SO4401
11-SL-02	11SO1301	11SO2601-D	11SO4401-AVG
11-SL-03	11SO1401	11SO2701	11SO4401-D
11-SL-05	11SO1501	11SO2801	11SO4501
11SO0101	11SO1601	11SO2901	11SO4801
11SO0201	11SO1701	11SO3001	11SO4901
11SO0301	11SO1801	11SO3101	11SO4901-AVG
11SO0401	11SO1901	11SO3201	11SO4901-D
11SO0501	11SO2001	11SO3301	11SO5001
11SO0601	11SO2101	11SO3401	11SO5101
11SO0601-AVG	11SO2201	11SO3501	11SS4701
11SO0601-D	11SO2201-AVG	11SO3601	11SS4702
11SO0701	11SO2201-D	11SO3701	11SS4703
11SO0801	11SO2301	11SO3801	
11SO0901	11SO2401	11SO4101	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 5-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
67-64-1	ACETONE	1/9	0.1 J	0.1	11-SL-02	NA (5)	100000
	Semivolatile Organics (mg/kg)						
50-32-8	BENZO(A)PYRENE	1/16	0.043	0.043	11SS4703	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/9	0.13 J	0.13	11SO0201	NA	31000
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	1/9	0.14 J	0.14	11-SL-02	NA	---
72-55-9	4,4'-DDE	6/14	0.088 J	0.04	11-SL-02	NA	---
50-29-3	4,4'-DDT	8/14	0.53 J	0.3	11-SL-02	NA	---
309-00-2	ALDRIN	1/9	0.00096 J	0.00096	11SO0201	NA	---
5103-71-9	ALPHA-CHLORDANE	8/14	0.549	0.2	11SO4801	NA	---
60-57-1	DIELDRIN	12/14	0.21 J	0.1	11-SL-02	NA	---
5103-74-2	GAMMA-CHLORDANE	8/14	0.678	0.2	11SO4801	NA	---
76-44-8	HEPTACHLOR	2/14	0.139	0.08	11SO4801	NA	---
1024-57-3	HEPTACHLOR EPOXIDE	5/14	0.0626 J	0.06	11SO4801	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	7/7	302 J	302	11SS4701	NA	---

<u>Footnotes</u>:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

TABLE 5-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)

Associated Samples:

11-SL-01	11SO0801	11SO2001	11SO3001	11SO4301
11-SL-01-AVG	11SO0901	11SO2101	11SO3101	11SO4401
11-SL-01-D	11SO1001	11SO2201	11SO3201	11SO4401-AVG
11-SL-02	11SO1101	11SO2201-AVG	11SO3301	11SO4401-D
11-SL-03	11SO1201	11SO2201-D	11SO3401	11SO4501
11-SL-05	11SO1301	11SO2301	11SO3501	11SO4801
11SO0101	11SO1401	11SO2401	11SO3601	11SO4901
11SO0201	11SO1501	11SO2501	11SO3701	11SO4901-AVG
11SO0301	11SO1601	11SO2601	11SO3801	11SO4901-D
11SO0401	11SO1701	11SO2601-AVG	11SO4101	11SO5001
11SO0501	11SO1801	11SO2601-D	11SO4201	11SO5101
11SO0601	11SO1901	11SO2701		11SS4701
11SO0601-AVG		11SO2801		11SS4702
11SO0601-D		11SO2901		11SS4703
11SO0701				

TABLE 5-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
67-64-1	ACETONE	0.1 J	0.1	5500	N	1.8E-05	NA (6)	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
50-32-8	BENZO(A)PYRENE	0.043	0.043	0.5	C	8.6E-02	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.13 J	0.13	280	C	4.6E-04	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-54-8	4,4'-DDD	0.14 J	0.14	18	C	7.8E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.088 J	0.04	13	C	6.8E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.53 J	0.3	13	C	4.1E-02	NA	No	maximum < SCTL
309-00-2	ALDRIN	0.00096 J	0.00096	0.3	C	3.2E-03	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.549	0.2	12	C	4.6E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.21 J	0.1	0.3	C	7.0E-01	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.678	0.2	12	C	5.7E-02	NA	No	maximum < SCTL
76-44-8	HEPTACHLOR	0.139	0.08	0.9	C	1.5E-01	NA	No	maximum < SCTL
1024-57-3	HEPTACHLOR EPOXIDE	0.0626 J	0.06	0.4	C	1.6E-01	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	10800	10800	---	N	---	no	No	maximum < SCTL
7440-36-0	ANTIMONY	3.5 J	3.5	240	N	1.5E-02	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.8	3.8	3.7	C	**1.0E+00**	no	No	(8)
7440-39-3	BARIUM	96	96	87000	N	1.1E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.14	800	N	1.8E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	0.28 J	0.28	1300	N	2.2E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	1790	1790	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	19.6	19.6	420	C	4.7E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	3.4 J	3.4	110000	N	3.1E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	19.4	19.4	76000	N	2.6E-04	yes	No	maximum < SCTL
7439-89-6	IRON	11700	11700	480000	N	2.4E-02	no	No	maximum < SCTL
7439-92-1	LEAD	2230	93.1	920		2.4E+00	yes	No (9)	average < SCTL
7439-95-4	MAGNESIUM	1260	1260	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	285	285	22000	N	1.3E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.08	0.08	26	N	3.1E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	10	10	28000	N	3.6E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	166 J	166	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.16 J	0.16	10000	N	1.6E-05	NE	No	maximum < SCTL
7440-22-4	SILVER	1.9 J	1.9	9100	N	2.1E-04	NE	No	maximum < SCTL

TABLE 5-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7440-23-5	SODIUM	307 J	307	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	20.3	20.3	7400	N	2.7E-03	no	No	maximum < SCTL
7440-66-6	ZINC	260	260	560000	N	4.6E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.19 J	0.19	39000	N	4.9E-06	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	302 J	302	2500	N	1.2E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 11 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.
9 The arithmetic mean lead concenetration is less than the 400 mg/kg and 920 mg/kg SCTLs. Therefore, lead is not selected as a potential COC.

TABLE 5-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments

Associated Samples:

11-SL-01	11SO1001	11SO2501	11SO4201
11-SL-01-AVG	11SO1101	11SO2601	11SO4301
11-SL-01-D	11SO1201	11SO2601-AVG	11SO4401
11-SL-02	11SO1301	11SO2601-D	11SO4401-AVG
11-SL-03	11SO1401	11SO2701	11SO4401-D
11-SL-05	11SO1501	11SO2801	11SO4501
11SO0101	11SO1601	11SO2901	11SO4801
11SO0201	11SO1701	11SO3001	11SO4901
11SO0301	11SO1801	11SO3101	11SO4901-AVG
11SO0401	11SO1901	11SO3201	11SO4901-D
11SO0501	11SO2001	11SO3301	11SO5001
11SO0601	11SO2101	11SO3401	11SO5101
11SO0601-AVG	11SO2201	11SO3501	11SS4701
11SO0601-D	11SO2201-AVG	11SO3601	11SS4702
11SO0701	11SO2201-D	11SO3701	11SS4703
11SO0801	11SO2301	11SO3801	
11SO0901	11SO2401	11SO4101	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 5-7

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
Volatile Organics (mg/kg)									
67-64-1	ACETONE	0.1 J	0.1	780	N	1.3E-04	NA (6)	No	maximum < SCTL
108-88-3	TOLUENE	0.004 J	0.004	380	N	1.1E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.008 J	0.008	5900	N	1.4E-06	NA	No	maximum < SCTL
Semivolatile Organics (mg/kg)									
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.1 J	0.1	76	C	1.3E-03	NA	No	maximum < SCTL
Pesticides PCBs (mg/kg)									
72-54-8	4,4'-DDD	0.12	0.12	4.6	C	2.6E-02	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.027	0.027	3.3	C	8.2E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.028 J	0.028	3.3	C	8.5E-03	NA	No	maximum < SCTL
309-00-2	ALDRIN	0.007 J	0.007	0.07	C	1.0E-01	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.26 J	0.26	0.5	C	5.2E-01	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.062 J	0.062	0.5	C	1.2E-01	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.033 J	0.033	0.07	C	4.7E-01	NA	No	maximum < SCTL
Inorganics (mg/kg)									
7429-90-5	ALUMINUM	19400	19400	72000	N	2.7E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	5.5	5.5	0.8	C	**6.9E+00**	no	No	(8)
7440-39-3	BARIUM	28.5 J	28.5	110	N	2.6E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.21 J	0.21	120	N	1.8E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	6.5	6.5	75	N	8.7E-02	yes	No	maximum < SCTL
7440-70-2	CALCIUM	12100	12100	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	19.5	19.5	210	C	9.3E-02	no	No	maximum < SCTL
7440-48-4	COBALT	1.7 J	1.7	4700	N	3.6E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	17.2	17.2	110	N	1.6E-01	NE	No	maximum < SCTL
7439-89-6	IRON	16800	16800	23000	N	7.3E-01	no	No	(8)
7439-92-1	LEAD	109	60.3	400		2.7E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	311 J	311	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	188	188	1600	N	1.2E-01	no	No	maximum < SCTL
7439-97-6	MERCURY	0.2 J	0.2	3.4	N	5.9E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	3.9 J	3.9	110	N	3.5E-02	NE	No	maximum < SCTL
7782-49-2	SELENIUM	0.56 J	0.56	390	N	1.4E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	189 J	189	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	37.5	37.5	15	N	**2.5E+00**	no	No	(8)
7440-66-6	ZINC	298	298	23000	N	1.3E-02	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 5-7

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 11 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

11SO2001	11SO2201-D
11SO2001	11SO2301
11SO2101	11SO2301
11SO2101	11SO2401
11SO2201	11SO2401
11SO2201-AVG	

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 5-8

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
Volatile Organics (mg/kg)							
67-64-1	ACETONE	2/3	0.1 J	0.1	11SS0101	NA (5)	100000
108-88-3	TOLUENE	1/3	0.004 J	0.004	11SS0101	NA	650
1330-20-7	TOTAL XYLENES	3/3	0.008 J	0.008	11SS0303	NA	140
Semivolatile Organics (mg/kg)							
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/3	0.1 J	0.1	11SS0101	NA	31000
Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	2/3	0.12	0.12	11SS0303	NA	---
72-55-9	4,4'-DDE	3/3	0.027	0.027	11SS0202	NA	---
50-29-3	4,4'-DDT	2/3	0.028 J	0.028	11SS0303	NA	---
309-00-2	ALDRIN	1/3	0.007 J	0.007	11SS0101	NA	---
11097-69-1	AROCLOR-1254	1/3	0.26 J	0.26	11SS0101	NA	---
11096-82-5	AROCLOR-1260	1/3	0.062 J	0.062	11SS0101	NA	---
60-57-1	DIELDRIN	3/3	0.033 J	0.033	11SS0303	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:
11SS0101
11SS0202
11SS0303

TABLE 5-9

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL USING MAXIMUM CONCENTRATIONS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration	Sample of Maximum Detection	Region 4 Eco SS Criteria	Maximum Hazard Quotient	COPC?	Notes
Volatile Organics (ug/kg)									
ACETONE	1/9	100 J	100 J	16.1	11-SL-02	---	NA	**Y**	
Semivolatile Organics (ug/kg)									
BENZO(A)PYRENE	1/16	43	43	478	11SS4703	100	0.43	N	
BIS(2-ETHYLHEXYL)PHTHALATE	4/9	52 J	130 J	340	11SO0201	---	NA	**Y**	
Pesticides PCBs (ug/kg)									
4,4'-DDD	1/9	140 J	140 J	57.4	11-SL-02	2.5	**56**	**Y**	
4,4'-DDE	6/14	2.1	88 J	23.0	11-SL-02	2.5	**35.2**	**Y**	
4,4'-DDT	8/14	2.3	530 J	56.2	11-SL-02	2.5	**212**	**Y**	
TOTAL DDT		144.4	758	136.5	11-SL-02	2.5	**303.2**	**Y**	
ALDRIN	1/9	0.96 J	0.96 J	48.1	11SO0201	2.5	0.38	N	
DIELDRIN	12/14	3.5	210 J	43.6	11-SL-02	0.5	**420**	**Y**	
ALPHA-CHLORDANE	8/14	20.8	549	119	11SO4801	---	NA	**Y**	
GAMMA-CHLORDANE	8/14	16.6	678	116	11SO4801	---	NA	**Y**	
HEPTACHLOR	2/14	4.8 J	139	43.2	11SO4801	---	NA	**Y**	
HEPTACHLOR EPOXIDE	5/14	1.1 J	62.6 J	38.9	11SO4801	---	NA	**Y**	
Inorganics (mg/kg)									
ALUMINUM	9/9	2110	10800	7639	11-SL-01-D, 11-SL-02	50	**216**	**Y**	
ANTIMONY	1/9	3.5 J	3.5 J	4.17	11-SL-02	3.5	**1.0**	**Y**	
ARSENIC	9/9	0.93 J	3.8	2.16	11-SL-02	10	0.38	N	
BARIUM	9/9	4.6 J	96	20.6	11-SL-02	165	0.58	N	
BERYLLIUM	7/9	0.05 J	0.14 J	0.0750	11-SL-02	1.1	0.13	N	
CADMIUM	2/9	0.24 J	0.28 J	0.361	11SO0201	1.6	0.18	N	
CALCIUM	9/9	183 J	1790	467	11-SL-02	---	NA	N	nutrient
CHROMIUM	9/9	2.7	19.6	8.27	11-SL-02	0.4	**49**	**Y**	
COBALT	5/9	0.94 J	3.4 J	2.68	11-SL-02	20	0.17	N	
COPPER	7/9	3.7 J	19.4	6.49	11-SL-02	40	0.49	N	
IRON	9/9	1500	11700	5439	11-SL-02	200	**58.5**	**Y**	
LEAD	47/47	5.2	2230	93.1	11-SL-02	50	**44.6**	**Y**	
MAGNESIUM	9/9	54.2 J	1260	228	11-SL-02	---	NA	N	nutrient
MANGANESE	9/9	31.4	285	135	11-SL-01-D	100	**2.85**	**Y**	
MERCURY	5/9	0.04 J	0.08	0.0533	11SO0501	0.1	0.8	N	
NICKEL	4/9	1.6 J	10	2.99	11-SL-02	30	0.33	N	
POTASSIUM	8/9	62.1 J	166 J	106	11-SL-02	---	NA	N	nutrient
SELENIUM	1/9	0.16 J	0.16 J	0.344	11SO0101	0.81	0.20	N	
SILVER	4/9	0.55 J	1.9 J	1.02	11-SL-02	2	0.95	N	
SODIUM	9/9	160 J	307 J	188	11-SL-02	---	NA	N	nutrient
VANADIUM	9/9	4.4 J	20.3	13.3	11-SL-02	2	**10.15**	**Y**	
ZINC	9/9	5.7	260	43.9	11-SL-02	50	**5.2**	**Y**	
Miscellaneous Parameter (mg/kg)									
CYANIDE	5/9	0.09 J	0.19 J	0.121	11SO0201	0.9	0.21	N	
Petroleum Hydrocarbons (mg/kg)									
TOTAL PETROLEUM HYDROCARBONS	7/7	7	302 J	57.2	11SS4701	---	NA	N	

COPC - Chemical of Potential Concern
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 5-10

HAZARD QUOTIENTS USING MAXIMUM SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - CONSERVATIVE INPUTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse NOAEL HQ	Shrew NOAEL HQ	Bobwhite NOAEL HQ	Robin NOAEL HQ	Hawk NOAEL HQ	Fox NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	2.55E-03	2.57E-01	1.40E-02	**5.42E+00**	6.30E-02	8.75E-03
4,4'-DDE	1.64E-03	1.62E-01	8.88E-03	**3.41E+00**	1.15E-02	1.59E-03
4,4'-DDT	8.96E-03	9.73E-01	5.21E-02	**2.05E+01**	2.39E-01	3.31E-02
DDTR	1.28E-02	**1.39E+00**	7.45E-02	**2.93E+01**	**2.34E+00**	3.25E-01
CHLORDANE,ALPHA	1.87E-03	7.19E-02	2.36E-03	3.67E-01	2.77E-02	1.59E-02
CHLORDANE,GAMMA	2.31E-03	8.88E-02	2.92E-03	4.53E-01	3.43E-02	1.97E-02
DIELDRIN	2.43E-01	**8.15E+00**	2.86E-02	**5.02E+00**	3.53E-01	**1.68E+00**
HEPTACHLOR	3.92E-02	**1.58E+00**	NA	NA	NA	3.65E-01
HEPTACHLOR EPOXIDE	1.01E-02	2.44E-01	NA	NA	NA	5.12E-02
Metals and Inorganic Compounds						
CHROMIUM	1.45E-04	7.30E-04	1.96E-01	**4.74E+00**	1.41E-01	6.36E-05
LEAD	**5.53E+00**	**2.72E+01**	**1.96E+01**	**4.57E+02**	**1.59E+01**	**2.77E+00**
ZINC	1.32E-01	6.67E-01	3.64E-01	**1.75E+01**	6.44E-01	7.20E-02

NOAEL - No observed adverse effect level
HQ - Hazard Quotient
NA - Not available

TABLE 5-11

COMPARISON OF USEPA REGION 4 ECOLOGICAL SCREENING LEVELS TO SURFACE SOIL MEAN CONCENTRATIONS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration[1]	Region 4 Eco SS Criteria	Mean Hazard Quotient
Volatile Organics (ug/kg)						
ACETONE	1/9	100 J	100 J	16.1	---	NA
BIS(2-ETHYLHEXYL)PHTHALATE	4/9	52 J	130 J	340	---	NA
Pesticides PCBs (ug/kg)						
4,4'-DDD	1/9	140 J	140 J	57.4	2.5	**22.94**
4,4'-DDE	6/14	2.1	88 J	23.0	2.5	**9.19**
4,4'-DDT	8/14	2.3	530 J	56.2	2.5	**22.48**
TOTAL DDT		144.4	758	136.5	2.5	**54.61**
DIELDRIN	12/14	3.5	210 J	43.6	0.5	**87.17**
ALPHA-CHLORDANE	8/14	20.8	549	119	---	NA
GAMMA-CHLORDANE	8/14	16.6	678	116	---	NA
HEPTACHLOR	2/14	4.8 J	139	43.2	---	NA
HEPTACHLOR EPOXIDE	5/14	1.1 J	62.6 J	38.9	---	NA
Inorganics (mg/kg)						
ALUMINUM	9/9	2110	10800	7639	50	**152.8**
ANTIMONY	1/9	3.5 J	3.5 J	4.17	3.5	**1.19**
CHROMIUM	9/9	2.7	19.6	8.27	0.4	**20.68**
IRON	9/9	1500	11700	5439	200	**27.20**
LEAD	47/47	5.2	2230	93.1	50	**1.86**
MANGANESE	9/9	31.4	285	135	100	**1.35**
VANADIUM	9/9	4.4 J	20.3	13.3	2	**6.66**
ZINC	9/9	5.7	260	43.9	50	0.88

NA - not applicable
Eco SS - USEPA Region 4 ecological screening levels for soils

1 Means were calculated with all data substituting one-half the detection limit for results reported as non-detected .

TABLE 5-12

HAZARD QUOTIENTS USING MEAN SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
Ecological Contaminant of Concern	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ
Pesticides												
4,4'-DDD	4.48E-04	8.97E-05	8.77E-02	1.75E-02	4.22E-03	4.22E-04	**1.69E+00**	1.69E-01	1.95E-02	1.95E-03	2.10E-03	4.21E-04
4,4'-DDE	1.83E-04	3.67E-05	3.51E-02	7.02E-03	1.70E-03	1.70E-04	6.78E-01	6.78E-02	2.26E-03	2.26E-04	2.44E-04	4.87E-05
4,4'-DDT	4.07E-04	8.14E-05	8.59E-02	1.72E-02	4.05E-03	4.05E-04	**1.66E+00**	1.66E-01	1.91E-02	1.91E-03	2.06E-03	4.12E-04
DDTR	9.89E-04	1.98E-04	2.09E-01	4.18E-02	9.85E-03	9.85E-04	**4.03E+00**	4.03E-01	3.19E-01	3.19E-02	3.43E-02	6.9E-03
DIELDRIN	2.16E-02	2.16E-03	**1.41E+00**	1.41E-01	4.35E-03	4.35E-04	7.94E-01	7.94E-02	5.54E-02	5.54E-03	2.04E-01	2.0E-02
HEPTACHLOR	5.22E-03	5.22E-04	4.09E-01	4.09E-02	NA	NA	NA	NA	NA	NA	6.65E-02	6.7E-03
HEPTACHLOR EPOXIDE	2.68E-03	2.68E-04	1.26E-01	1.26E-02	NA	NA	NA	NA	NA	NA	1.87E-02	1.9E-03
Metals and Inorganic Compounds												
CHROMIUM	2.62E-05	2.62E-06	2.57E-04	2.57E-05	6.06E-02	1.21E-02	**1.52E+00**	3.05E-01	4.50E-02	9.00E-03	1.57E-05	1.57E-06
LEAD	9.89E-02	9.89E-03	9.47E-01	9.47E-02	5.99E-01	5.99E-02	**1.45E+01**	**1.45E+00**	5.02E-01	5.02E-02	6.79E-02	6.79E-03
ZINC	9.56E-03	4.78E-03	9.39E-02	4.69E-02	4.51E-02	5.00E-03	**2.25E+00**	2.49E-01	8.23E-02	9.11E-03	7.14E-03	3.57E-03

NOAEL - No observed adverse effect level
LOAEL - Lowest observed adverse effect level
HQ - Hazard Quotient

TABLE 5-13

NUMBER OF SAMPLE LOCATIONS EXCEEDING USEPA REGION 4 ECOLOGICAL SOIL SCREENING LEVELS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

Chemicals of Potential Concern	Region 4 Surface Soil Screening Value	Total Number of Samples	Number of Samples Exceeding or Equal to Screening Value
Pesticides PCBs (ug/kg)			
4,4'-DDD	2.5	9	1
4,4'-DDE	2.5	14	4
4,4'-DDT	2.5	14	7
DIELDRIN	0.5	14	12
TOTAL DDT	2.5	14	8
Inorganics (mg/kg)			
ALUMINUM	50	9	9
ANTIMONY	3.5	9	1
CHROMIUM	0.4	9	9
IRON	200	9	9
LEAD	50	47	10
MANGANESE	100	9	5
VANADIUM	2	9	9
ZINC	50	9	1

TABLE 5-14

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
MAXIMUM CONCENTRATIONS WITH AND WITHOUT SAMPLE 11-SL-02
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Maximum Concentration With 11-SL-02	Sample of Maximum Detection With 11-SL-02	Maximum Concentration Without 11-SL-02	Sample of Maximum Detection Without 11-SL-02	Region 4 Eco SS Criteria	Maximum Hazard Quotient With 11-SL-02	Maximum Hazard Quotient Without 11-SL-02
Semivolatile Organics (ug/kg)								
BIS(2-ETHYLHEXYL)PHTHALATE	4/9	130 J	11SO0201	130 J	11SO0201	---	NA	NA
Pesticides PCBs (ug/kg)								
4,4'-DDD	1/9	140 J	11-SL-02	ND[1]	ND[1]	2.5	**56**	ND[1]
4,4'-DDE	6/14	88 J	11-SL-02	64 J	11-SL-05	2.5	**35.2**	**25.6**
4,4'-DDT	8/14	530 J	11-SL-02	45 J	11-SL-05	2.5	**212**	**18**
DIELDRIN	12/14	210 J	11-SL-02	136	11SS4701	0.5	**420**	**272**
ALPHA-CHLORDANE	8/14	549	11SO4801	549	11SO4801	---	NA	NA
GAMMA-CHLORDANE	8/14	678	11SO4801	678	11SO4801	---	NA	NA
HEPTACHLOR	2/14	139	11SO4801	139	11SO4801	---	NA	NA
HEPTACHLOR EPOXIDE	5/14	62.6 J	11SO4801	62.6 J	11SO4801	---	NA	NA
Inorganics (mg/kg)								
CHROMIUM	9/9	19.6	11-SL-02	11.8	11SO0501	0.4	**49**	**29.5**
LEAD	47/47	2230	11-SL-02	666	11S03801	50	**44.6**	**13.3**
MANGANESE	9/9	285	11-SL-01-D	285	11-SL-01-D	100	**2.85**	**2.85**
VANADIUM	9/9	20.3	11-SL-02	117.8	11SO0501	2	**10.15**	**8.9**
ZINC	9/9	260	11-SL-02	47.8	11-SL-03	50	**5.2**	0.96

ND[1] - 4,4-DDD only detected at 11-SL-02
ND - not detected
Eco SS - USEPA Reigon 4 ecological screening levels for soils

TABLE 5-15

HAZARD QUOTIENTS USING MEAN SURFACE SOIL CONCENTRATIONS WITHOUT 11-SL-02
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
Ecological Contaminant of Concern	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**
Pesticides												
4,4'-DDT	1.30E-04	2.61E-05	2.75E-02	5.50E-03	1.30E-04	1.30E-05	5.31E-01	5.31E-02	6.13E-04	6.13E-05	6.60E-05	1.32E-05
DDTR	1.30E-04	2.61E-05	2.75E-02	5.50E-03	1.30E-04	1.30E-05	5.31E-01	5.31E-02	4.20E-03	4.20E-04	4.53E-04	9.1E-05
DIELDRIN	1.44E-02	1.44E-03	9.37E-01	9.37E-02	2.90E-04	2.90E-05	5.28E-01	5.28E-02	3.69E-03	3.69E-04	1.36E-02	1.4E-03
HEPTACHLOR	3.02E-03	3.02E-04	2.36E-01	2.36E-02	NA	NA	NA	NA	NA	NA	3.85E-03	3.8E-04
HEPTACHLOR EPOXIDE	1.45E-03	1.45E-04	6.81E-02	6.81E-03	NA	NA	NA	NA	NA	NA	1.01E-03	1.0E-04
Metals and Inorganic Compounds												
CHROMIUM	2.20E-05	2.20E-06	2.16E-04	2.16E-05	5.09E-03	1.02E-03	**1.28E+00**	2.56E-01	3.78E-03	7.56E-04	1.32E-06	1.32E-07
LEAD	4.85E-02	4.85E-03	4.65E-01	4.65E-02	2.94E-02	2.94E-03	**7.14E+00**	7.14E-01	2.47E-02	2.47E-03	3.33E-03	3.33E-04
ZINC	3.40E-03	1.70E-03	3.33E-02	1.67E-02	1.60E-03	1.77E-04	7.99E-01	8.84E-02	2.92E-03	3.23E-04	2.53E-04	1.27E-04

NOAEL - No observed adverse effect level
LOAEL - Lowest observed adverse effect level

TABLE 5-16

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL COMPARISON TO BACKGROUND
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration	Sample of Maximum Detection	Region 4 Eco SS Criteria	Maximum Hazard Quotient	Site Greater Than Background?	COPC?	Notes
Pesticides PCBs (ug/kg)										
4,4'-DDD	1/9	140 J	140 J	57.4	11-SL-02	2.5	**56**	NA	**Y**	Food chain
4,4'-DDE	6/14	2.1	88 J	23.0	11-SL-02	2.5	**35.2**	NA	**Y**	
4,4'-DDT	8/14	2.3	530 J	56.2	11-SL-02	2.5	**212**	NA	**Y**	Food chain
TOTAL DDT		144.4	758	136.5	11-SL-02	2.5	**303.2**	NA	**Y**	Food chain
DIELDRIN	12/14	3.5	210 J	43.6	11-SL-02	0.5	**420**	NA	**Y**	Food chain
Inorganics (mg/kg)										
ALUMINUM	9/9	2110	10800	7639	11-SL-01-D, 11-SL-02	50	**216**	N	**N**	
ANTIMONY	1/9	3.5 J	3.5 J	4.17	11-SL-02	3.5	**1.0**	N	**N**	
CHROMIUM	9/9	2.7	19.6	8.27	11-SL-02	0.4	**49**	N	**N**	
IRON	9/9	1500	11700	5439	11-SL-02	200	**58.5**	N	**N**	
LEAD	47/47	5.2	2230	93.1	11-SL-02	50	**44.6**	Y	**Y**	Food chain
MANGANESE	9/9	31.4	285	135	11-SL-01-D	100	**2.85**	N	**N**	
VANADIUM	9/9	4.4 J	20.3	13.3	11-SL-02	2	**10.15**	N	**N**	
ZINC	9/9	5.7	260	43.9	11-SL-02	50	**5.2**	Y	**Y**	Food chain

COPC - Chemical of potential concern
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 5-17

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
SAMPLES EXCEEDING VARIOUS GUIDELINES
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

	Concentration		Beyer 1990				CCME		Dutch (2000)			
Parameter	Maximum	Mean[1]	"A" Value	Samples Above Guideline	"B" Value	Samples Above Guideline	1997 Updated 1999	Samples Above Guideline	Target	Samples Above Guideline	Intervention	Samples Above Guideline
Volatile Organics (ug/kg)												
ACETONE	100 J	16.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organics (ug/kg)												
BIS(2-ETHYLHEXYL)PHTHALATE	130 J	340	NA	NA	NA	NA	NA	NA	100[2]	1 of 9	60000[2]	0 of 9
Pesticides PCBs (ug/kg)												
4,4'-DDD	140 J	57.4	100[3]	1 of 9	500[3]	0	NA	NA	NA	NA	NA	NA
4,4'-DDE	88 J	23.0	100[3]	0 of 14	500[3]	0 of 14	NA	NA	NA	NA	NA	NA
4,4'-DDT	530 J	56.2	100[3]	1 of 14	500[3]	1 of 14	NA	NA	NA	NA	NA	NA
TOTAL DDT	758	136.5	NA	NA	NA	NA	700	1 of 14	10	6 of 14	4000	0 of 14
DIELDRIN	210 J	43.6	100[3]	2 of 14	500[3]	0 of 14	NA	NA	0.5	12 of 14	NA	NA
ALPHA-CHLORDANE	549	119	100[3]	5 of 14	500[3]	1 of 14	NA	NA	0.03	10 of 14	4000	0 of 14
GAMMA-CHLORDANE	678	116	100[3]	5 of 14	500[3]	1 of 14	NA	NA	0.03	10 of 14	4000	0 of 14
HEPTACHLOR	139	43.2	100[3]	1 of 14	500[3]	0 of 14	NA	NA	0.7	2 of 14	4000	0 of 14
HEPTACHLOR EPOXIDE	62.6 J	38.9	100[3]	0 of 14	500[3]	0 of 14	NA	NA	0.0002	7 of 14	4000	0 of 14
Inorganics (mg/kg)												
LEAD	2230	93.1	50	10 of 47	150	5 of 47	140	5 of 47	85	8 of 47	530	2 of 47
ZINC	260	43.9	200	1 of 9	500	0 of 9	200	1 of 9	140	1 of 9	720	0 of 9

NA - Guideline not available
1 Means were calculated with all data substituting one-half the detection limit for results reported as non-detected.
2 Value for total phthalates.
3 Organochlorinated (each) value.

TABLE 5-18

SUMMARY OF COPCS FOR ECOLOGICAL RISK ASSESSMENT OF SITE 11 SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Range of Detection			Location of Maximum Concentration	EPA Region 4 Screening Criteria	Maximum Hazard Quotient	Mean Hazard Quotient	# Samples Exceeding Criteria	Range of Detection Limits	Below Background Concentration?	Retained as COPC in Surface Soil?
		Minimum	Maximum	Mean[1]								
Volatile Organics (ug/kg)												
ACETONE	1/9	100	100	16.1	11-SL-02	NA	NA	NA	NA	11 - 12	NA[3]	No[ade]
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE	1/16	43	43	477.8	11SS4703	100	0.43	4.78	NA	10 - 4000	NA[3]	No[ac]
BIS(2-ETHYLHEXYL)PHTHALATE	4/9	52	130	340.2	11SO0201	NA	NA	NA	NA	350 - 4000	NA[3]	No[ae]
Pesticides PCBs (ug/kg)												
4,4'-DDD	1/9	140	140	57.4	11-SL-02	2.5	56	22.94	1	3.6 - 680	NA[3]	Yes[fg]
4,4'-DDE	6/14	2.1	88	23.0	11-SL-02	2.5	35.2	9.19	4	3.5 - 140	NA[3]	Yes[fg]
4,4'-DDT	8/14	2.3	530	56.2	11-SL-02	2.5	212.0	22.48	7	3.5 - 140	NA[3]	Yes[fg]
TOTAL DDT		144.4	758	136.5	11-SL-02	2.5	303.2	54.61	8		NA[3]	Yes[fg]
ALDRIN	1/9	0.96	0.96	48.1	11SO0201	2.5	0.4	19.25	NA	1.9 - 490	NA[3]	No[c]
DIELDRIN	12/14	3.5	210	43.6	11-SL-02	0.5	420	87.17	12	3.7 - 18	NA[3]	Yes[fg]
ALPHA-CHLORDANE	8/14	20.8	549	119.2	11SO4801	NA	NA	NA	1	1.9 - 180	NA[3]	Yes[h]
GAMMA-CHLORDANE	8/14	16.6	678	115.9	11SO4801	NA	NA	NA	NA	1.9 - 180	NA[3]	Yes[h]
HEPTACHLOR	2/14	4.8	139	43	11SO4801	NA	NA	NA	NA	1.8 - 490	NA[3]	No[a]
HEPTACHLOR EPOXIDE	5/14	1.1	62.6	38.9	11SO4801	NA	NA	NA	NA	1.8 - 490	NA[3]	Yes[h]
Inorganics (mg/kg)												
ALUMINUM	9/9	2110	10800	7639.4	11-SL-01-D, 11-SL-02	50	216	152.79	9	---	Y	No[be]
ANTIMONY	1/9	3.5	3.5	4.2	11-SL-02	3.5	1	1.19	1	2.6 - 12	Y	No[b]
ARSENIC	9/9	0.93	3.8	2.2	11-SL-02	10	0.4	0.22	NA	---	NA[4]	No[bc]
BARIUM	9/9	4.6	96	21	11-SL-02	165	0.6	0.12	NA	---	N	No[c]
BERYLLIUM	7/9	0.05	0.14	0.1	11-SL-02	1.1	0	0.07	NA	0.05	NA[4]	No[bc]
CADMIUM	2/9	0.24	0.28	0.4	11SO0201	1.6	0.2	0.23	NA	0.58 - 1	NA[4]	No[bc]
CALCIUM	9/9	183	1790	466.6	11-SL-02	NA	NA	NA	NA	---	NA[4]	No[i]
CHROMIUM	9/9	2.7	19.6	8.3	11-SL-02	0.4[2]	49	19.70	9	---	Y	No[b]
COBALT	5/9	0.94	3.4	2.7	11-SL-02	20	0.2	0.13	NA	0.33 - 10	NA[4]	No[bc]
COPPER	7/9	3.7	19.4	6.5	11-SL-02	40	0.5	0.16	NA	5	N	No[bc]
IRON	9/9	1500	11700	5439.4	11-SL-02	200	58.5	27.20	9	---	Y	No[e]
LEAD	47/47	5.2	2230	93.1	11-SL-02	50	44.6	1.86	10	---	N	Yes[fg]
MAGNESIUM	9/9	54.2	1260	228.5	11-SL-02	NA	NA	NA	NA	---	NA[4]	No[i]
MANGANESE	9/9	31.4	285	135.3	11-SL-01-D	100	2.9	1.35	NA	---	Y	No[b]
MERCURY	5/9	0.04	0.08	0.1	11SO0501	0.1	0.80	0.53	NA	0.1	NA[4]	No[bc]
NICKEL	4/9	1.6	10	3.0	11-SL-02	30	0.33	0.10	NA	2.3 - 8	NA[4]	No[bc]
POTASSIUM	8/9	62.1	166	105.8	11-SL-02	NA	NA	NA	NA	132	NA[4]	No[i]
SELENIUM	1/9	0.16	0.16	0.3	11SO0101	0.81	0.20	0.43	NA	0.45 - 1	NA[4]	No[bc]
SILVER	4/9	0.55	1.9	1.0	11-SL-02	2	0.95	0.51	NA	2	NA[4]	No[bc]
SODIUM	9/9	160	307	188.1	11-SL-02	NA	NA	NA	NA	---	NA[4]	No[i]
VANADIUM	9/9	4.4	20.3	13.3	11-SL-02	2	10.2	6.66	9	---	Y	No[b]
ZINC	9/9	5.7	260	43.9	11-SL-02	50	5.2	0.88	1	---	N	Yes[fg]

COPC = Contaminant of potential concern.
Hazard quotient = chemical concentration ÷ USEPA Region 4 criteria
NA = Not available
1 Means were calculated using one-half the detection limit for results reported as non-detected.
2 Criteria for hexavalent chromium.
3 Not analyzed for in backgound data set.
4 Not analyzed in background data due to absence of site risk.
a Infrequent detection.
b Site concentrations are less than background concentrations.
c Maximum concentration is less than USEPA Region 4 screening level.
d This chemical does not biomagnify in the food chain.
e Anticipated low bioavailability.
f Potential risk to terrestrial receptors via direct contact.
g Potential risk to terrestrial receptors via the food chain.
h No USEPA Region 4 screening level available. Potential risk found when compared to available guidelines.
i Nutrient.

6.0 SITE 12, TETRAETHYL LEAD DISPOSAL AREA

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 12. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation)

6.1 SITE DESCRIPTION

Site 12 (adjacent to Site 11) is less than 0.1 acre in size and is located in the southeastern section of the facility. The disposal area consists of six earth-covered sludge mounds within a fenced area of approximately 100 feet by 25 feet. The mounds range from approximately 3 to 5 feet in height and 5 to 10 feet in diameter. Each sludge pile reportedly contained 200 to 400 gallons tank bottom sludge generated from cleaning the north and south aqua system fuel storage tanks and fuel filters. The piles are reported to be contaminated with tetraethyl lead, a component of aviation gasoline (AVGAS). The sludge was stockpiled at its current location in May 1968.

The approximate location of Site 12 is shown on Figure 1-2 of the 1999 RI report. There are currently no buildings at Site 12. No permanent surface water sources exist at Site 12. However, the "Y" drainage ditch, which is not concrete-lined, is located immediately adjacent to the southern border of the site and receives any surface runoff from the area. The drainage ditch ultimately discharges to Big Cold Water Creek, approximately 1.7 miles east of the site.

Currently, the site is vacant, unused land that is densely vegetated with native species. The terrain at Site 12 is relatively flat. These site characteristics limit the current potential for fugitive dust emissions and soil transport by surface water runoff.

6.2 SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATION FOR SOILS

To characterize the sludge mounds, surface soil samples were collected from mounds A through D and the surrounding soil areas. The surface soil dataset for Site 12 consists of surface soil samples collected from six locations (12SO01 through 12SO06) during the 1995/1996 Phase IIB field investigation. The Phase IIB surface soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, cyanide, and TRPH.

The subsurface soil dataset for Site 12 consists of samples collected from 10 locations during the Phase IIA and Phase IIB investigations. Eight soil samples (12-SS-01 to 12-SS-08) were collected from the interface between the mounds (A through E) and the natural ground surface during the 1993 Phase IIA investigation and two subsurface soil samples (12B00101 and 12B00102) were collected from one location (near Mound C) during the 1996 Phase IIB investigation. The Phase IIA samples were collected at a depth interval of 2.2 feet to 3.8 feet bgs and analyzed for TAL inorganics and cyanide. The Phase IIB samples were collected at depths intervals of 5 to 6 feet and 10 to 11 feet bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, cyanide and TRPH.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 6-1 and 6-2, respectively.

Surface and subsurface soil sample locations are presented on Figure 2-1 of the 1999 RI report.

6.3 DATA EVALUATION

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 12. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 6-1 and 6-2, respectively.

6.3.1 Surface Soil

Five SVOCs, one pesticide, 20 inorganics, cyanide, and TRPH were detected in six surface soil samples collected at Site 12. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 6-1. Also presented in Table 6-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Dieldrin was the only chemical detected in surface soil at a maximum concentration exceeding direct contact, risk based COPC screening levels and was retained as a COPC for surface soil at Site 12. Concentrations of dieldrin exceeded the simple apportioned PRG and SCTL but were less than the non-apportioned PRG and SCTL.

Although concentrations of aluminum, arsenic, iron, and vanadium in surface soil exceeded the screening criteria (Table 6-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field disposal areas are composed of natural soil covers and do not reflect subsurface contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 12. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 12 surface soils.

6.3.2 Subsurface Soil

One VOC, one SVOC, and 20 inorganics were detected in 10 subsurface soil samples collected at Site 12. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 6-2. The concentrations of all chemicals were less than direct contact, risk based COPC screening levels with the exception of aluminum, arsenic, iron, manganese, and vanadium. Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 12. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 12 subsurface soils. Consequently, no COPCs were identified for subsurface soil at Site 12.

6.4 RISK CHARACTERIZATION

This section provides a characterization of potential human health risks associated with potential exposures to chemicals in the surface and subsurface soils at Site 12. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

6.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 12 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 6.3. Potential cancer risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 6-3. The results are discussed below. Chemical-specific risks for Site 12 are presented in Appendix B. No COPCs were identified in subsurface soil samples; therefore, risks were only calculated for exposures to surface soil.

Non-carcinogenic Risk

Cumulative HIs for exposures to surface soil by all receptors were less than 1, indicating adverse non-carcinogenic effects are not anticipated for these receptors under the conditions defined in the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs estimated for exposures to surface soil were less than USEPA's target risk range of 10^{-4} to 10^{-6} and the State of Florida's target risk level of 1×10^{-6} for all receptors.

6.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 12 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 6-4 through 6-7 and are discussed below.

6.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 6-4 presents a comparison of maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs. The maximum detected concentrations and EPCs for all chemicals were less than the Level 1 SCTLs with the exception of arsenic and vanadium. The maximum detected concentrations of arsenic also exceeded three times the residential SCTL. However, please see the preceding discussion (Section 6.3.1) regarding these metals. Arsenic, and vanadium were not retained as COCs for residential exposures to surface soil at the Site 12. Thus, no chemicals were retained as COCs for residential exposures to surface soil at Site 12.

As shown in Table 6-5, the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No COCs were identified in the Level 1 evaluation for surface soil; consequently, Level 2 and Level 3 evaluations were not required.

6.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 6-6 presents a comparison of maximum detected concentrations and EPCs for subsurface soil to FDEP residential SCTLs. The maximum detected concentrations and EPCs for all chemicals were less than the Level 1 SCTLs with the exception of arsenic and vanadium. The maximum detected concentration of arsenic also exceeded three times the residential SCTL. However, please see the preceding discussion (Section 6.3.2) regarding these metals. No chemicals were retained as COCs for residential exposures to subsurface soil at Site 12.

As shown in Table 6-7, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No COCs were identified in the Level 1 evaluation for subsurface soil; consequently, Level 2 and Level 3 evaluations were not required.

6.5 SITE-SPECIFIC UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

6.5.1 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 12 were selected using available background concentrations for soil. Aluminum, arsenic, iron, and vanadium in surface soil and aluminum, arsenic, iron, manganese, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	15,300	25,400	72,000
Arsenic	3.8	5.3	0.8
Iron	9,200	16,100	23,000
Manganese	Not Applicable	222	1,600
Vanadium	26.8	41.7	15

The SCTLs presented for aluminum, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-fifth of the SCTL, and the maximum detected concentration in subsurface soil is approximately two-fifths of the SCTL. The maximum detected concentration of iron in surface soil is two-fifths of the SCTL, and the maximum detected concentration is subsurface soil is approximately two-thirds of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse noncancer health effects. The maximum detected concentration of manganese in subsurface soil is approximately one-sixth of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 1.8 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 2.8 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the value presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1×10^{-6} cancer risk level but not the 1×10^{-5} and 1×10^{-4} risk levels.

6.6 SUMMARY AND CONCLUSIONS

A HHRA was conducted for the chemical concentrations detected in six surface soil and 10 subsurface soil samples collected at Site 12. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 12. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

Dieldrin was the only chemical selected as a COPC for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. No chemicals were selected as COPCs for subsurface soil. The non-cancer risk estimates (i.e., HIs) for dieldrin did not exceed 1 for any of the receptors evaluated. Consequently, adverse non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Cancer risk estimates for dieldrin did not exceed the State of Florida cancer risk benchmark of 1×10^{-6} or the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. None of the chemicals detected in the Site 12 surface or subsurface soils were identified as potential COCs based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

TABLE 6-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Semivolatile Organics (mg/kg)																
50-32-8	BAP EQUIVALENT	1/6	0.005 J	0.005 J	0.37 - 0.39	12S00501	0.005	NA (13)	0.062 C	0.01	0.1 C	0.1	---	0.02	5.2E-02	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/6	0.047 J	0.051 J	0.37 - 0.39	12S00501	0.051	NA	35 C	6	76 C	72	---	15	6.7E-04	No	BSL
206-44-0	FLUORANTHENE	1/6	0.068 J	0.068 J	0.37 - 0.39	12S00501	0.068	NA	2300 N	230	2900 N	3200	Blood, Kidney , Liver	970	2.3E-05	No	BSL
129-00-0	PYRENE	1/6	0.055 J	0.055 J	0.37 - 0.39	12S00501	0.055	NA	2300 N	230	2200 N	2400	Kidney	730	2.5E-05	No	BSL
	Pesticides PCBs (mg/kg)																
60-57-1	**DIELDRIN**	3/6	0.0033	0.013	3.7 - 3.8	12S00501	0.013	NA	0.03 C	**0.005**	0.07 C	0.06	---	0.014	1.9E-01	**Yes**	**ASL**
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	6/6	7000	15300	---	12S00101	15300	no	76000 N	**7600**	72000 N	80000	Body Weight	24000	2.1E-01	No	BKG
7440-38-2	ARSENIC	6/6	2.4	3.8	---	12S00101	3.8	no	0.39 C	**0.07**	0.8 C	2.1	---	**0.16**	**4.8E+00**	No	BKG
7440-39-3	BARIUM	6/6	10 J	14.5 J	---	12S00501	14.5	no	5400 N	540	110 N	120	Cardiovascular	110	1.3E-01	No	BSL,BKG
7440-41-7	BERYLLIUM	3/6	0.08 J	0.14 J	1	12S00501	0.14	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.2E-03	No	BSL
7440-43-9	CADMIUM	1/6	0.41 J	0.41 J	1	12S00401	0.41	NE	37 N	3.7	75 N	82	Kidney	75	5.5E-03	No	BSL
7440-70-2	CALCIUM	6/6	67.4 J	985 J	---	12S00501	985	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	6/6	8.1	20.3	---	12S00101	20.3	NE	210 C	35	210 C	210	---	42	9.7E-02	No	BSL
7440-48-4	COBALT	5/6	0.44 J	0.96 J	10	12S00601	0.96	NE	900 C	150	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	940	2.0E-04	No	BSL
7440-50-8	COPPER	2/6	3.9 J	5.8 J	5	12S00401	5.8	NE	3100 N	310	110 N	150	Gastrointestinal	110	5.3E-02	No	BSL
7439-89-6	IRON	6/6	5190	9200	---	12S00101	9200	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7670**	4.0E-01	No	BKG
7439-92-1	LEAD	6/6	5.8 J	15.6	---	12S00201	15.6	NE	400	400	400	400	---	400	3.9E-02	No	BSL
7439-95-4	MAGNESIUM	6/6	88.2 J	161 J	---	12S00501	161	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	6/6	78.3	156	---	12S00501	156	no	1800 N	180	1600 N	3500	Neurological	320	9.8E-02	No	BSL,BKG
7439-97-6	MERCURY	3/6	0.02 J	0.04 J	0.1	12S00101	0.04	NE	23 N	2.3	3.4 N	3	Neurological	0.68	1.2E-02	No	BSL
7440-02-0	NICKEL	5/6	1.6 J	5.2 J	8	12S00601	5.2	NE	1600 N	160	110 N	340	Body Weight	110	4.7E-02	No	BSL
7440-09-7	POTASSIUM	2/6	97.5 J	131 J	1000	12S00401	131	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	1/6	0.36 J	0.36 J	1	12S00101	0.36	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	78	9.2E-04	No	BSL
7440-23-5	SODIUM	3/6	180 J	188 J	1000	12S00201	188	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	6/6	12.5	26.8	---	12S00101	26.8	no	550 N	55	15 N	67	NOEL	**15**	1.8E+00	No	BKG
7440-66-6	ZINC	3/6	5.2	8.4	4	12S00401	8.4	NE	23000 N	2300	23000 N	26000	Blood	7670	3.7E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	3/6	0.09 J	0.13 J	0.5	12S00401	0.13	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	4.3E-03	No	BSL
	Petroleum Hydrocarbons (mg/kg)																
TTNUS001	TRPH	6/6	10.6	56.8	---	12S00501	56.8	NA	---	---	340 N	460	Multiple endpoints	170	1.7E-01	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 6-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 6 chemicals detected in surface soil at Site 12 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 6. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 5 chemicals classified as carcinogens were detected in surface soil at Site 12. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 5. For noncarcinogens, neurological effects were identified as the target organ for 5 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 5. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
12S00101
12S00201
12S00301
12S00401
12S00501
12S00601

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 6-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
Volatile Organics (mg/kg)																	
75-09-2	METHYLENE CHLORIDE	1/2	0.001 J	0.001 J	0.011	12B00102	0.001	NA (13)	9.1 C	2.3	16 C	17	---	5	6.3E-05	No	BSL
Semivolatile Organics (mg/kg)																	
84-66-2	DIETHYL PHTHALATE	1/2	0.83	0.83	0.37 - 0.39	12B00101	0.83	NA	49000 N	4900	54000 N	61000	Body Weight	18000	1.5E-05	No	BSL
Inorganics (mg/kg)																	
7429-90-5	ALUMINUM	10/10	5260	25400	---	12B00101	25400	no	76000 N	**7600**	72000 N	80000	Body Weight	**24000**	3.5E-01	No	BKG
7440-38-2	ARSENIC	10/10	0.53 J	5.3	---	12B00101	5.3	no	0.39 C	**0.10**	0.8 C	2.1	---	**0.27**	**6.6E+00**	No	BKG
7440-39-3	BARIUM	10/10	7.7 J	18.8 J	---	12-SS-01	18.8	NE (14)	5400 N	540	110 N	120	Cardiovascular	110	1.7E-01	No	BSL
7440-41-7	BERYLLIUM	4/10	0.1 J	0.24 J	0.07 - 0.11	12-SS-01	0.24	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	2.0E-03	No	BSL
7440-43-9	CADMIUM	7/10	0.16 J	0.57 J	0.15 - 0.28	12B00101	0.57	NE	37 N	3.7	75 N	82	Kidney	75	7.6E-03	No	BSL
7440-70-2	CALCIUM	10/10	230 J	5960	---	12-SS-01	5960	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	10/10	5.8	19.9	---	12B00101	19.9	NE	210 C	53	210 C	210	---	70	9.5E-02	No	BSL
7440-48-4	COBALT	5/10	1.1 J	1.6 J	0.51 - 1.2	12-SS-08	1.6	NE	900 C	225	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	1180	3.4E-04	No	BSL
7440-50-8	COPPER	8/10	3.9 J	7.2	2.9 - 6.3	12-SS-05	7.2	NE	3100 N	310	110 N	150	Gastrointestinal	110	6.5E-02	No	BSL
7439-89-6	IRON	10/10	3780	16100	---	12B00101	16100	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7670**	7.0E-01	No	BKG
7439-92-1	LEAD	10/10	3.4 J	29.9	---	12-SS-01	29.9	NE	400	400	400	400	---	400	7.5E-02	No	BSL
7439-95-4	MAGNESIUM	10/10	96.7 J	1130	---	12-SS-01	1130	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	10/10	4.9	222	---	12-SS-01	222	no	1800 N	**180**	1600 N	3500	Neurological	400	1.4E-01	No	BKG
7439-97-6	MERCURY	5/10	0.03 J	0.04 J	0.01 - 0.03	12-SS-01, 12-SS-02, 12B00101, 12B00101-D	0.04	NE	23 N	2.3	3.4 N	3	Neurological	0.85	1.2E-02	No	BSL
7440-02-0	NICKEL	6/10	1.9 J	3.3 J	1.6 - 1.7	12-SS-08	3.3	NE	1600 N	160	110 N	340	Body Weight	110	3.0E-02	No	BSL
7440-09-7	POTASSIUM	9/10	81.2 J	232 J	70.2 - 166	12-SS-01	232	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	6/10	0.16 J	0.27 J	0.13 - 0.24	12-SS-08	0.27	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	97.5	6.9E-04	No	BSL
7440-23-5	SODIUM	8/10	169 J	225 J	33.4 - 49.8	12-SS-01	225	NE	---	---	---	---		---		No	NUT
7440-62-2	VANADIUM	10/10	10.3 J	41.7	---	12B00101	41.7	no	550 N	55	15 N	67	NOEL	**15**	2.8E+00	No	BKG
7440-66-6	ZINC	8/10	5.8 J	12.6 J	3 - 8.2	12-SS-04	12.6	NE	23000 N	2300	23000 N	26000	Blood	11500	5.5E-04	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 4 chemicals detected in subsurface soil at Site 12. are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 4. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 3 carcinogens were detected in subsurface soil at Site 12. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 3. For noncarcinogens, neurological effects were identified as the target organ for 4 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 4. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL, and, for metals, if site concentrations exceed background levels.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:
12B00101
12B00101-AVG
12B00101-D
12B00102
12-SS-01
12-SS-02
12-SS-03
12-SS-04
12-SS-04-AVG
12-SS-04-D
12-SS-05
12-SS-06
12-SS-07
12-SS-08

TABLE 6-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	2E-07	- -	- -	- -	0.004	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Industrial Workers	Surface Soil	4E-08	- -	- -	- -	0.0004	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Construction Workers	Surface Soil	1E-08	- -	- -	- -	0.001	- -
	Subsurface Soil	NE	- -	- -	- -	NE	- -
Maintenance Workers	Surface Soil	1E-08	- -	- -	- -	0.00004	- -
Adolescent Recreational Users	Surface Soil	2E-08	- -	- -	- -	0.0001	- -
Adult Recreational Users	Surface Soil	1E-08	- -	- -	- -	0.00007	- -
Lifelong Recreational Users	Surface Soil	3E-08	- -	- -	- -	NA	- -

Notes:
NE - Not evaluated. There were no COPCs identified for subsurface soil.
NA - Not applicable.
HI - Hazard Index.

TABLE 6-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Semivolatile Organics (mg/kg)								
50-32-8	BAP EQUIVALENT	0.005 J	0.005	0.1	C	5.2E-02	NA (6)	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.051 J	0.051	76	C	6.7E-04	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.068 J	0.068	2900	N	2.3E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	0.055 J	0.055	2200	N	2.5E-05	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
60-57-1	DIELDRIN	0.013	0.013	0.07	C	1.9E-01	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	15300	15300	72000	N	2.1E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.8	3.8	0.8	C	**4.8E+00**	no	No	(8)
7440-39-3	BARIUM	14.5 J	14.5	110	N	1.3E-01	no	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.14	120	N	1.2E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	0.41 J	0.41	75	N	5.5E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	985 J	985	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	20.3	20.3	210	C	9.7E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	0.96 J	0.96	4700	N	2.0E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	5.8 J	5.8	110	N	5.3E-02	NE	No	maximum < SCTL
7439-89-6	IRON	9200	9200	23000	N	4.0E-01	no	No	(8)
7439-92-1	LEAD	15.6	12.3	400		---	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	161 J	161	---		---	NE	No	maximum < SCTL
7439-96-5	MANGANESE	156	156	1600	N	9.8E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.04 J	0.04	3.4	N	1.2E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	5.2 J	5.2	110	N	4.7E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	131 J	131	---		---	NE	No	maximum < SCTL
7782-49-2	SELENIUM	0.36 J	0.36	390	N	9.2E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	188 J	188	---		---	NE	No	maximum < SCTL
7440-62-2	VANADIUM	26.8	26.8	15	N	**1.8E+00**	no	No	(8)
7440-66-6	ZINC	8.4	8.4	23000	N	3.7E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.13 J	0.13	30	N	4.3E-03	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	56.8	56.8	340	N	1.7E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 6-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 12 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
12S00101
12S00201
12S00301
12S00401
12S00501
12S00601

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 6-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Semivolatile Organics (mg/kg)						
50-32-8	BAP EQUIVALENT	1/6	0.005 J	0.005	12S00501	NA (5)	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/6	0.051 J	0.051	12S00501	NA	31000
206-44-0	FLUORANTHENE	1/6	0.068 J	0.068	12S00501	NA	---
129-00-0	PYRENE	1/6	0.055 J	0.055	12S00501	NA	85
	Pesticides PCBs (mg/kg)						
60-57-1	DIELDRIN	3/6	0.013	0.013	12S00501	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	6/6	56.8	56.8	12S00501	NA	---

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

12S00101	12S00401
12S00201	12S00501
12S00301	12S00601

TABLE 6-6

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
Volatile Organics (mg/kg)									
75-09-2	METHYLENE CHLORIDE	0.001 J	0.001	16	C	6.3E-05	NA (6)	No	maximum < SCTL
Semivolatile Organics (mg/kg)									
84-66-2	DIETHYL PHTHALATE	0.83	0.83	54000	N	1.5E-05	NA	No	maximum < SCTL
Inorganics (mg/kg)									
7429-90-5	ALUMINUM	25400	13400	72000	N	3.5E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	5.3	2.2	0.8	C	**6.6E+00**	no	No	(8)
7440-39-3	BARIUM	18.8 J	14.7	110	N	1.7E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.24 J	0.12	120	N	2.0E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	0.57 J	0.35	75	N	7.6E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	5960	2920	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	19.9	12.2	210	C	9.5E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1.6 J	1.6	4700	N	3.4E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	7.2	5.9	110	N	6.5E-02	NE	No	maximum < SCTL
7439-89-6	IRON	16100	8180	23000	N	7.0E-01	no	No	(8)
7439-92-1	LEAD	29.9	10.2	400		---	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	1130	415	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	222	157	1600	N	1.4E-01	no	No	maximum < SCTL
7439-97-6	MERCURY	0.04 J	0.031	3.4	N	1.2E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	3.3 J	2.8	110	N	3.0E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	232 J	193	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.27 J	0.24	390	N	6.9E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	225 J	191	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	41.7	25.4	15	N	**2.8E+00**	no	No	(8)
7440-66-6	ZINC	12.6 J	10.1	23000	N	5.5E-04	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 12 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

12B00101	12-SS-04
12B00101-AVG	12-SS-04-AVG
12B00101-D	12-SS-04-D
12B00102	12-SS-05
12-SS-01	12-SS-06
12-SS-02	12-SS-07
12-SS-03	12-SS-08

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 6-7

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
Volatile Organics (mg/kg)							
75-09-2	METHYLENE CHLORIDE	1/2	0.001 J	0.001	12B00102	NA (5)	2400
Semivolatile Organics (mg/kg)							
84-66-2	DIETHYL PHTHALATE	1/2	0.83	0.83	12B00101	NA	2000

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

12B00101	12-SS-01	12-SS-03	12-SS-05
12B00101-D	12-SS-01	12-SS-03	12-SS-05
12B00102	12-SS-02	12-SS-04	
12B00102	12-SS-02	12-SS-04-D	

7.0 SITE 13, SANITARY LANDFILL

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 13. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted using guidelines recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

7.1 SITE DESCRIPTION

Site 13 is approximately 4 acres in size and is located along the eastern facility boundary near the South Air Field. The site is rectangular in shape and oriented north to south. The site was used as the primary sanitary landfill for NAS Whiting Field from 1979 to 1984. During 1979, waste solvents and residue from paint-stripping operations may have been disposed at the site. After 1979, the landfill reportedly received only general refuse and non-hazardous waste. At the time of the RI fieldwork, buried wastes were not exposed at the land surface, and there were no indications of other past waste disposal practices (e.g., stained soil or stressed vegetation).

The approximate location of Site 13 is shown on Figure 1-2 of the 1999 RI report. There are currently no buildings at Site 13.

No permanent surface water sources exist in the immediate vicinity of Site 13. However, a vegetated "Y" drainage ditch borders the landfill to the west and south. The general slope of the land is from northwest to southeast. The landfill is depressed relative to the surrounding land surface, and surface water runoff typically ponds on site. However, when there is surface runoff from the site, it drains toward Big Coldwater Creek located approximately 8,800 feet east of the site.

Currently, Site 13 consists of exposed soil with sparse native grasses and scrub oak vegetative cover in the central area. The bordering areas are predominantly covered with planted pine trees. Site 13 is vacant, unused land at this time.

7.2 SUMMARY OF PHASE IIA/IIB AND SUPPLEMENTAL FIELD INVESTIGATIONS FOR SOILS

A surface soil assessment was conducted in two phases (Phase IIA and IIIB) during the RI of Site 13. Phase IIA included the collection of surface soil samples from five locations (13-SL-01 through 13-SL-05) in 1992. The 1995 Phase IIB investigation included the collection of five additional surface soil samples (13SO0101 through 13SO0501).

The Phase IIA surface soil sample locations were based on observed surface conditions and co-located with geophysical surface anomalies. The Phase IIA soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide. Based on the presence of chemicals previously detected at Site 13, the Phase IIB samples were collected from 0 to 12 inches bgs and also analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide. Because arsenic concentrations in the original Phase IIA and IIB investigations exceeded applicable screening criteria, an additional 19 surface soil samples were collected in August 1999 and analyzed for arsenic only (HLA, 1999).

To characterize waste materials within the landfill, test pits were excavated where geophysical anomalies identified potential locations of buried materials. The subsurface soil dataset for Site 13 consists of one subsurface soil sample collected from each of three test pits (TP-13-02, TP-13-03 and TP-13-05) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from depth intervals of 5 to 6, 8 to 10 and 8 to 9 feet bgs for test pits TP-13-02, TP-13-03, and TP-13-05, respectively, and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 7-1 and 7-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Most surface and subsurface soil sample locations are presented on Figure 3-2 of the 1999 RI report.

7.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 13. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 7-1 and 7-2, respectively.

7.3.1 Surface Soil

One VOC, three SVOCs, and 20 inorganics were detected in surface soil samples collected at Site 13. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 7-1. Also presented in Table 7-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Maximum concentrations of all chemicals were less than the direct contact, risk based COPC screening levels with the exception of aluminum, arsenic, iron, manganese, and vanadium. Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 13. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 13 surface soils. Therefore, no chemicals were retained as COPCs for direct contact exposures to surface soil at the Site 13.

7.3.2 Subsurface Soil

Seven VOCs, five SVOCs, 20 inorganics, and cyanide were detected in three subsurface soil samples collected at Site 13. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 7-2. Also presented in Table 7-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A.

Mercury was the only chemical detected at a concentration in excess of direct contact, risk based COPC screening levels and background concentrations, and was retained as a COPC for subsurface soil at Site 13. Concentrations of mercury exceeded the simple apportioned PRG and simple apportioned and non-apportioned SCTLs but were less than the non-apportioned PRG.

Concentrations of aluminum, antimony, arsenic, chromium, iron, and vanadium also exceeded the screening criteria. Although concentrations of aluminum, arsenic, iron, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 13. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 12 subsurface soils.

Antimony and chromium were not selected as COPCs based on the site data-to-background data comparisons presented in Appendix A.

7.4 RISK CHARACTERIZATION

This section provides a characterization of potential human health risks associated with potential exposures to chemicals in surface and subsurface soils at Site 13. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

7.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 13 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 7.3. Potential risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 7-3. The results are discussed below. Chemical-specific risks for Site 13 are presented in Appendix B. No COPCs were retained for surface soil at Site 13; therefore, risks were only calculated for exposures to subsurface soil.

Non-carcinogenic Risk

Cumulative HIs estimated for exposures to mercury in subsurface soil by all receptors were less than 1, indicating that adverse, non-carcinogenic effects are not anticipated under the conditions established in the exposure assessment.

Carcinogenic Risk

CSFs are not available for the mercury, the only COPC selected for Site 13; therefore, ILCRs were not calculated.

7.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 13 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 7-4 through 7-8 and are discussed below.

7.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 7-4 presents a comparison of maximum detected concentrations and EPCs for surface soil to the FDEP residential SCTLs. Maximum detected concentrations and EPCs for all chemicals approximated or were less than the Level 1 SCTLs with the exception of arsenic, iron, and vanadium. The maximum detected concentrations of arsenic and vanadium also exceeded three times the residential SCTLs. However, please see the preceding discussion (Section 7.3.1) regarding these metals. No chemicals were retained as COCs for residential exposures to surface soil at Site 13.

As shown in Table 7-5, the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No COCs were identified in the Level 1 evaluation; consequently, Level 2 and Level 3 evaluations were not required.

7.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 7-6 presents a comparison of maximum detected concentrations and EPCs for subsurface soil to FDEP residential SCTLs. The following chemical was identified as exceeding the Level 1 SCTL and background concentrations, and was retained as a potential COC for residential exposures to subsurface soil at Site 13:

- Mercury

The maximum detected concentration and EPCs for arsenic and vanadium also exceeded the Level 1 criteria, and the maximum detected concentration of arsenic exceeded three times the residential SCTL. However, please see the preceding discussion (Section 7.3.2) regarding these metals. Arsenic and vanadium were not retained as COCs for residential exposures to subsurface soil at the Site 13. The maximum detected concentrations of all organics were less than three times the residential SCTLs.

As shown in Table 7-7, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified mercury as a potential COC; therefore, a Level 2 evaluation was conducted. A comparison of maximum detected concentrations and EPCs for subsurface soil to FDEP industrial SCTLs is presented in Table 7-8. The maximum detected mercury concentration did not exceed the FDEP industrial SCTL; therefore, mercury was not retained as a COC for industrial exposures to subsurface soil. The maximum detected concentration of arsenic exceeded the Level 2 SCTL. However, please see the preceding discussion (Section 7.3.2) regarding arsenic. Arsenic was not retained as a COC for industrial exposures to subsurface soil at the Site 13. Thus, there were no chemicals retained as COCs for subsurface soils at Site 13 for the Level 2 evaluation.

Level 3 Evaluation (Recreational)

No potential COCs were identified in the Level 2 evaluation; consequently, a Level 3 evaluation was not required.

7.5 SITE-SPECIFIC UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

7.5.1 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 13 were selected using available background concentrations for soil. Aluminum, arsenic, iron, manganese, and vanadium in surface soil and aluminum, antimony, arsenic, chromium, iron, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	38,300	23,900	72,000
Arsenic	7.2	6.5	0.8
Antimony	NA	3.7	27
Chromium	NA	21	210
Iron	23,500	16,200	23,000
Manganese	407	NA	1,600
Vanadium	62.4	44.6	15

NA: Not applicable

The SCTLs presented for aluminum, antimony, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-half of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-third of the SCTL. The maximum detected concentration of iron in surface soil marginally exceeds the SCTL, and the maximum detected concentration is subsurface soil is approximately two-thirds of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse non-cancer health effects. The maximum antimony concentration in subsurface soils is less than 20 percent of the relevant SCTL. The maximum detected concentration of manganese in surface soil is approximately one-fourth of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 4 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 3 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg. The maximum detected concentration of chromium in the subsurface soils in one-tenth of the SCTL.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1 x 10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1 x 10^{-5} and 1 x 10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1 x 10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1 x 10^{-6} cancer risk level but not the 1 x 10^{-5} and 1 x 10^{-4} risk levels.

7.5.2 Limited Subsurface Soil Dataset

Three subsurface soil samples only were collected for chemical analysis during the field investigation at Site 13. However, the subsurface soil samples were collected from test pits excavated at locations where geophysical anomalies identified the potential locations of buried materials.

7.6 SUMMARY AND CONCLUSIONS

A HHRA was conducted for the chemical concentrations detected in 29 surface soil and three subsurface soil samples collected at Site 13. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of these receptors are currently contacting surface or subsurface soils at Site 13. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

No chemicals were selected as COPCs for the surface soil. Mercury was the only chemical selected as a COPC for subsurface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) for mercury did not exceed 1 for any of the receptors evaluated. Consequently, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Cancer risk estimates were not calculated because mercury is not a carcinogenic chemical.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. No chemicals were selected as potential COCs for surface soil. Mercury was selected as a potential COC for subsurface soils (residential land use scenario only; Level 1 SCTLs). However, the State of Florida residential SCTL (3.4 mg/kg) for mercury in soils conservatively assumes that elemental mercury, a volatile metal, is present in the soil. Risks associated with the inhalation route of exposure significantly impact the SCTL. In contrast, the USEPA Region 9 residential PRG table presents a value for mercury and compounds (23 mg/kg) but does not specifically present a PRG for elemental mercury in soils (i.e., the preparers of the table did not automatically assume elemental mercury would be present in soils). Although it is plausible elemental mercury could be present in a sanitary landfill due to the disposal of thermometers, etc., it is unlikely that elemental mercury is the predominant form of mercury in the landfill. The maximum detected mercury concentration in subsurface soils (4.2 mg/kg) marginally exceeds the State of Florida SCTL for residential soils. As indicated in the preceding paragraph, adverse, non-carcinogenic health effects are not anticipated under the conditions established in the exposure assessment.

TABLE 7-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
75-09-2	METHYLENE CHLORIDE	4/10	0.004 J	0.008 J	0.011 - 0.017	13SO0501	0.008	NA (13)	9.1 C	2	16 C	17	---	4	8.8E-04	No	BSL
	Semivolatile Organics (mg/kg)																
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/10	0.064 J	0.45	0.37 - 0.39	13-SL-04	0.45	NA	35 C	7	76 C	72	---	19	1.3E-02	No	BSL
206-44-0	FLUORANTHENE	1/10	0.051 J	0.051 J	0.37 - 0.4	13-SL-01	0.051	NA	2300 N	230	2900 N	3200	Blood, Kidney , Liver	970	2.2E-05	No	BSL
129-00-0	PYRENE	1/10	0.061 J	0.061 J	0.37 - 0.4	13-SL-01	0.061	NA	2300 N	230	2200 N	2400	Kidney	1100	2.7E-05	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	10/10	8070	38300	---	13SO0301	38300	no	76000 N	**7600**	72000 N	80000	Body Weight	**36000**	5.0E-01	No	BKG
7440-38-2	ARSENIC	29/29	1.6 J	7.2	---	13SO0701	7.2	no	0.39 C	**0.08**	0.8 C	2.1	---	**0.2**	**1.8E+01**	No	BKG
7440-39-3	BARIUM	10/10	5.9 J	26.6 J	---	13SO0101	26.6	no	5400 N	540	110 N	120	Cardiovascular	110	4.9E-03	No	BSL,BKG
7440-41-7	BERYLLIUM	4/10	0.06 J	0.16 J	0.06 - 1	13-SL-04	0.16	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.1E-03	No	BSL
7440-70-2	CALCIUM	10/10	34.2 J	525 J	---	13-SL-01	525	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	10/10	6.9	27.9	---	13SO0301	27.9	NE	210 C	42	210 C	210	---	52.5	1.3E-01	No	BSL
7440-48-4	COBALT	9/10	0.48 J	1.9 J	0.34	13SO0101	1.9	NE	900 C	180	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	1180	2.1E-03	No	BSL
7440-50-8	COPPER	6/10	4	9.2	5	13-SL-01	9.2	NE	3100 N	310	110 N	150	Gastrointestinal	110	3.0E-03	No	BSL
7439-89-6	IRON	10/10	4960	23500	---	13SO0301	23500	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7670**	1.0E+00	No	BKG
7439-92-1	LEAD	10/10	3.2	10.5	---	13-SL-04	10.5	NE	400	400	400	400	---	400	2.6E-02	No	BSL
7439-95-4	MAGNESIUM	10/10	50.6 J	203 J	---	13SO0301	203	NE	---	---	---	---	---	---		No	NUT
7439-96-5	MANGANESE	10/10	18.7	407 J	---	13SO0101	407	no	1800 N	**180**	1600 N	3500	Neurological	**400**	2.3E-01	No	BKG
7439-97-6	MERCURY	10/10	0.01 J	0.05 J	---	13-SL-02, 13-SL-05, 13-SL-05-D	0.05	NE	23 N	2.3	3.4 N	3	Neurological	0.85	2.2E-03	No	BSL
7440-02-0	NICKEL	7/10	2.8 J	6.7 J	2.4 - 2.5	13SO0301	6.7	NE	1600 N	160	110 N	340	Body Weight	110	4.2E-03	No	BSL
7440-09-7	POTASSIUM	1/10	150 J	150 J	132 - 1000	13SO0301	150	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	1/10	0.27 J	0.27 J	0.46 - 1	13SO0301	0.27	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	97.5	6.9E-04	No	BSL
7440-22-4	SILVER	5/10	0.36 J	1.2 J	2	13-SL-04	1.2	NE	390 N	39	390 N	410	Skin	195	3.1E-03	No	BSL
7440-23-5	SODIUM	5/10	173 J	262 J	1000	13-SL-05-D	262	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	10/10	13.1	62.4	---	13SO0301	62.4	no	550 N	**55**	15 N	67	NOEL	**15**	1.1E-01	No	BKG
7440-66-6	ZINC	5/10	7.8 J	17.5	4	13-SL-05	17.5	NE	23000 N	2300	23000 N	26000	Blood	7670	7.6E-04	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 7-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A.
If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 5 chemicals detected in surface soil at Site 13 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 5. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 4 chemicals classified carcinogens were detected in surface soil at Site 13. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 4. For noncarcinogens, neurological effects were identified as the target organ for 4 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 4. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

13-SL-01	13SO0101	13SO0801	13SO1501	13SO2001
13-SL-02	13SO0201	13SO0901	13SO1501-AVG	13SO2701
13-SL-03	13SO0301	13SO1001	13SO1501-D	13SO2801
13-SL-04	13SO0401	13SO1101	13SO1601	13SO3101
13-SL-05	13SO0501	13SO1201	13SO1701	13SO3201
13-SL-05-AVG	13SO0601	13SO1301	13SO1801	13SO3201-AVG
13-SL-05-D	13SO0701	13SO1401	13SO1901	13SO3201-D

TABLE 7-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
78-93-3	2-BUTANONE	1/3	0.27	0.27	0.011 - 0.013	13SS0503, 13SS0503-D	0.27	NA (13)	7300	N	730	3100	N	16000	Developmental	1000	1.7E-05	No	BSL
591-78-6	2-HEXANONE	2/3	0.003 J	0.019 J	0.013 - 0.056	13SS0503-D	0.019	NA	---		---	5.1	N	24	none specified	3	7.9E-04	No	BSL
108-10-1	4-METHYL-2-PENTANONE	1/3	0.027 J	0.034	0.011 - 0.013	13SS0503-D	0.034	NA	790	N	79	220	N	4300	Kidney, Liver	73	7.9E-06	No	BSL
67-64-1	ACETONE	3/3	0.067 J	0.7 J	---	13SS0503	0.7	NA	1600	N	160	780	N	11000	Kidney, Liver, Neurological	87	6.4E-05	No	BSL
75-15-0	CARBON DISULFIDE	1/3	0.002 J	0.002 J	0.013 - 0.056	13SS0302	0.002	NA	360	N	36	200	N	270	Developmental, Neurological	22	7.4E-06	No	BSL
108-88-3	TOLUENE	1/3	0.01 J	0.01 J	0.011 - 0.056	13SS0503-D	0.01	NA	520	sat	520	380	N	7500	Kidney, Liver, Neurological	42	1.3E-06	No	BSL
1330-20-7	TOTAL XYLENES	3/3	0.002 J	0.012 J	0.056	13SS0503-D	0.012	NA	270	N	27	5900	N	130	Body Weight, Mortality, Neurological	660	9.2E-05	No	BSL
	Semivolatile Organics (mg/kg)																		
106-44-5	4-METHYLPHENOL	2/3	0.068 J	1.2	0.43	13SS0503	1.2	NA	310	N	31	250	N	300	Maternal Death, Neurological, Respiratory	28	4.0E-03	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/3	0.41 J	0.41 J	0.41 - 0.43	13SS0503	0.41	NA	35	C	9	76	C	72	---	25	5.7E-03	No	BSL
84-66-2	DIETHYL PHTHALATE	1/3	0.099 J	0.14 J	0.38 - 0.43	13SS0503	0.14	NA	49000	N	4900	54000	N	61000	Body Weight	9000	2.3E-06	No	BSL
91-20-3	NAPHTHALENE	1/3	0.14 J	0.51	0.38 - 0.43	13SS0503	0.51	NA	56	N	5.6	40	N	55	Body Weight, Nasal	7	9.3E-03	No	BSL
108-95-2	PHENOL	1/3	0.13 J	0.13 J	0.38 - 0.43	13SS0503, 13SS0503-D	0.13	NA	37000	N	3700	900	N	500	Developmental	900	2.6E-04	No	BSL
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	3/3	10700	23900	---	13SS0201	23900	no	76000	N	7600	72000	N	80000	Body Weight	12000	3.0E-01	No	BKG
7440-36-0	ANTIMONY	1/3	3.7 J	3.7 J	2.8 - 2.9	13SS0503	3.7	no	31	N	3.1	26	N	27	Blood, Mortality	8.7	1.4E-01	No	BKG
7440-38-2	ARSENIC	3/3	3.4	6.5	---	13SS0201	6.5	no	0.39	C	0.10	0.8	C	2.1	---	0.27	3.1E+00	No	BKG
7440-39-3	BARIUM	3/3	6.3 J	7.5 J	---	13SS0201	7.5	NE (14)	5400	N	540	110	N	120	Cardiovascular	110	6.3E-02	No	BSL
7440-41-7	BERYLLIUM	3/3	0.16 J	0.2 J	---	13SS0201	0.2	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.7E-03	No	BSL
7440-70-2	CALCIUM	3/3	130 J	194 J	---	13SS0503-D	194	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	CHROMIUM	3/3	15.9	21	---	13SS0201	21	no	210	C	17.5	210	C	210	---	70	1.0E-01	No	BKG
7440-48-4	COBALT	3/3	0.63 J	1.4 J	---	13SS0201	1.4	NE	900	C	225	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	522	8.2E-04	No	BSL
7440-50-8	COPPER	3/3	3.9 J	5.8 J	---	13SS0201	5.8	NE	3100	N	310	110	N	150	Gastrointestinal	110	3.9E-02	No	BSL
7439-89-6	IRON	3/3	12200	16200	---	13SS0201	16200	no	23000	N	2300	23000	N	53000	Blood, Gastrointestinal	7670	3.1E-01	No	BKG
7439-92-1	LEAD	3/3	4.7	6	---	13SS0201	6	NE	400		400	400		400	---	400	1.5E-02	No	BSL
7439-95-4	MAGNESIUM	3/3	72.9 J	97.7 J	---	13SS0201	97.7	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	3/3	15.1	41.6	---	13SS0201	41.6	no	1800	N	180	1600	N	3500	Neurological	178	1.2E-02	No	BSL,BKG
7439-97-6	MERCURY	3/3	0.08 J	4.2	---	13SS0503	4.2	yes	23	N	2.3	3.4	N	3	Neurological	0.38	1.4E+00	Yes	ASL
7440-02-0	NICKEL	1/3	2.1 J	2.1 J	1.2 - 2.5	13SS0201	2.1	NE	1600	N	160	110	N	340	Body Weight	110	6.2E-03	No	BSL
7440-09-7	POTASSIUM	1/3	180 J	180 J	140 - 158	13SS0503	180	NE	---		---	---		---	---	---	---	No	NUT
7440-22-4	SILVER	3/3	0.5 J	0.62 J	---	13SS0503	0.62	NE	390	N	39	390	N	410	Skin	390	1.5E-03	No	BSL
7440-23-5	SODIUM	3/3	195 J	211 J	---	13SS0302	211	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	3/3	34.9	44.6	---	13SS0201	44.6	no	550	N	55	15	N	67	NOEL	15	6.7E-01	No	BKG
7440-66-6	ZINC	3/3	6	10.2	---	13SS0201	10.2	NE	23000	N	2300	23000	N	26000	Blood	7670	3.9E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																		
57-12-5	CYANIDE	1/3	0.12 J	0.12 J	0.1	13SS0503-D	0.12	NA	1200	N	120	30	N	34	Body Weight, Neurological, Thyroid	30	3.5E-03	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 7-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 4 chemicals detected in subsurface soil at Site 13 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 4. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 3 carcinogens were detected in subsurface soil at Site 13. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 3. For noncarcinogens, neurological effects were identified as the target organ for 9 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 9. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
13SS0201
13SS0302
13SS0503
13SS0503-AVG
13SS0503-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 7-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 13, SANITARY LANDFILL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	NTX	- -	- -	- -	1	- -
Industrial Workers	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	NTX	- -	- -	- -	0.2	- -
Construction Workers	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	NTX	- -	- -	- -	0.004	- -
Maintenance Workers	Surface Soil	NE	- -	- -	- -	NE	- -
Adolescent Recreational Users	Surface Soil	NE	- -	- -	- -	NE	- -
Adult Recreational Users	Surface Soil	NE	- -	- -	- -	NE	- -
Lifelong Recreational Users	Surface Soil	NE	- -	- -	- -	NA	- -

Notes:
NTX - Not applicable. There are no cancer slope factors (CSF) available for chemicals retained as COPCs.
NE - Not evaluated. There were no COPCs identified for surface soil.
NA - Not applicable.
HI - Hazard Index.

TABLE 7-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
75-09-2	METHYLENE CHLORIDE	0.008 J	0.007	16 C	5.0E-04	NA (6)	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.45	0.3	76 C	5.9E-03	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.051 J	0.051	2900 N	1.8E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	0.061 J	0.061	2200 N	2.8E-05	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	38300	21900	72000 N	5.3E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	7.2	5.1	0.8 C	**9.0E+00**	no	No	(8)
7440-39-3	BARIUM	26.6 J	14.8	110 N	2.4E-01	no	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.16 J	0.16	120 N	1.3E-03	NE (7)	No	maximum < SCTL
7440-70-2	CALCIUM	525 J	500	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	27.9	17.6	210 C	1.3E-01	NE	No	maximum < SCTL
7440-48-4	COBALT	1.9 J	1.6	4700 N	4.0E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	9.2	7.6	110 N	8.4E-02	NE	No	maximum < SCTL
7439-89-6	IRON	23500	14600	23000 N	**1.0E+00**	no	No	(8)
7439-92-1	LEAD	10.5	6.2	400	2.6E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	203 J	142	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	407 J	221	1600 N	2.5E-01	no	No	maximum < SCTL
7439-97-6	MERCURY	0.05 J	0.049	3.4 N	1.5E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	6.7 J	4.8	110 N	6.1E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	150 J	150	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.27 J	0.27	390 N	6.9E-04	NE	No	maximum < SCTL
7440-22-4	SILVER	1.2 J	1	390 N	3.1E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	262 J	219	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	62.4	39.4	15 N	**4.2E+00**	no	No	(8)
7440-66-6	ZINC	17.5	9.3	23000 N	7.6E-04	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 7-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 13 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

13-SL-01	13SO0101	13SO0801	13SO1501	13SO2001
13-SL-02	13SO0201	13SO0901	13SO1501-AVG	13SO2701
13-SL-03	13SO0301	13SO1001	13SO1501-D	13SO2801
13-SL-04	13SO0401	13SO1101	13SO1601	13SO3101
13-SL-05	13SO0501	13SO1201	13SO1701	13SO3201
13-SL-05-AVG	13SO0601	13SO1301	13SO1801	13SO3201-AVG
13-SL-05-D	13SO0701	13SO1401	13SO1901	13SO3201-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 7-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
75-09-2	METHYLENE CHLORIDE	4/10	0.008 J	0.007	13SO0501	NA (5)	2400
	Semivolatile Organics (mg/kg)						
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/10	0.45	0.3	13-SL-04	NA	31000
206-44-0	FLUORANTHENE	1/10	0.051 J	0.051	13-SL-01	NA	---
129-00-0	PYRENE	1/10	0.061 J	0.061	13-SL-01	NA	85

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:	13SO0801
13-SL-01	13SO0901
13-SL-02	13SO1001
13-SL-03	13SO1101
13-SL-04	13SO1201
13-SL-05	13SO1301
13-SL-05-D	13SO1401

TABLE 7-6

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.27	0.27	3100	N	8.7E-05	NA (6)	No	maximum < SCTL
591-78-6	2-HEXANONE	0.019 J	0.019	5.1	N	3.7E-03	NA	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.034	0.034	220	N	1.5E-04	NA	No	maximum < SCTL
67-64-1	ACETONE	0.7 J	0.7	780	N	9.0E-04	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.002 J	0.002	200	N	1.0E-05	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.01 J	0.01	380	N	2.6E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.012 J	0.012	5900	N	2.0E-06	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
106-44-5	4-METHYLPHENOL	1.2	1.2	250	N	4.8E-03	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.41 J	0.41	76	C	5.4E-03	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.14 J	0.14	54000	N	2.6E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.51	0.51	40	N	1.3E-02	NA	No	maximum < SCTL
108-95-2	PHENOL	0.13 J	0.13	900	N	1.4E-04	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	23900	23900	72000	N	3.3E-01	no	No	(8)
7440-36-0	ANTIMONY	3.7 J	3.7	26	N	1.4E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	6.5	6.5	0.8	C	8.1E+00	no	No	(8)
7440-39-3	BARIUM	7.5 J	7.5	110	N	6.8E-02	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.2 J	0.2	120	N	1.7E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	194 J	194	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	21	21	210	C	1.0E-01	no	No	maximum < SCTL
7440-48-4	COBALT	1.4 J	1.4	4700	N	3.0E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	5.8 J	5.8	110	N	5.3E-02	NE	No	maximum < SCTL
7439-89-6	IRON	16200	16200	23000	N	7.0E-01	no	No	(8)
7439-92-1	LEAD	6	5.63	400		1.5E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	97.7 J	97.7	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	41.6	41.6	1600	N	2.6E-02	no	No	maximum < SCTL
7439-97-6	**MERCURY**	4.2	4.2	3.4	N	1.2E+00	yes	Yes	maximum > SCTL
7440-02-0	NICKEL	2.1 J	2.1	110	N	1.9E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	180 J	180	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.62 J	0.62	390	N	1.6E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	211 J	211	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	44.6	44.6	15	N	3.0E+00	no	No	(8)
7440-66-6	ZINC	10.2	10.2	23000	N	4.4E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.12 J	0.12	30	N	4.0E-03	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 7-6

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 13 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
13SS0201
13SS0302
13SS0503
13SS0503-AVG
13SS0503-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 7-7

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	1/3	0.27	0.27	13SS0503, 13SS0503-D	NA (5)	34000
591-78-6	2-HEXANONE	2/3	0.019 J	0.019	13SS0503-D	NA	---
108-10-1	4-METHYL-2-PENTANONE	1/3	0.034	0.034	13SS0503-D	NA	17000
67-64-1	ACETONE	3/3	0.7 J	0.7	13SS0503	NA	100000
75-15-0	CARBON DISULFIDE	1/3	0.002 J	0.002	13SS0302	NA	730
108-88-3	TOLUENE	1/3	0.01 J	0.01	13SS0503-D	NA	650
1330-20-7	TOTAL XYLENES	3/3	0.012 J	0.012	13SS0503-D	NA	140
	Semivolatile Organics (mg/kg)						
106-44-5	4-METHYLPHENOL	2/3	1.2	1.2	13SS0503	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/3	0.41 J	0.41	13SS0503	NA	31000
84-66-2	DIETHYL PHTHALATE	1/3	0.14 J	0.14	13SS0503	NA	---
91-20-3	NAPHTHALENE	1/3	0.51	0.51	13SS0503	NA	220
108-95-2	PHENOL	1/3	0.13 J	0.13	13SS0503, 13SS0503-D	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:
13SS0201
13SS0302
13SS0503
13SS0503-D

TABLE 7-8

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.27	0.27	21000	N	1.3E-05	NA (6)	No	maximum < SCTL
591-78-6	2-HEXANONE	0.019 J	0.019	34	N	5.6E-04	NA	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.034	0.034	1500	N	2.3E-05	NA	No	maximum < SCTL
67-64-1	ACETONE	0.7 J	0.7	5500	N	1.3E-04	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.002 J	0.002	1400	N	1.4E-06	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.01 J	0.01	2600	N	3.8E-06	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.012 J	0.012	40000	N	3.0E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
106-44-5	4-METHYLPHENOL	1.2	1.2	3000	N	4.0E-04	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.41 J	0.41	280	C	1.5E-03	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.14 J	0.14	920000	N	1.5E-07	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.51	0.51	270	N	1.9E-03	NA	No	maximum < SCTL
108-95-2	PHENOL	0.13 J	0.13	390000	N	3.3E-07	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	23900	23900	---	N	---	no	No	(8)
7440-36-0	ANTIMONY	3.7 J	3.7	240	N	1.5E-02	no	No	maximum < SCTL
7440-38-2	ARSENIC	6.5	6.5	3.7	C	**1.8E+00**	no	No	(8)
7440-39-3	BARIUM	7.5 J	7.5	87000	N	8.6E-05	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.2 J	0.2	800	N	2.5E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	194 J	194	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	21	21	420	C	5.0E-02	no	No	maximum < SCTL
7440-48-4	COBALT	1.4 J	1.4	110000	N	1.3E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	5.8 J	5.8	76000	N	7.6E-05	NE	No	maximum < SCTL
7439-89-6	IRON	16200	16200	480000	N	3.4E-02	no	No	maximum < SCTL
7439-92-1	LEAD	6	5.63	920		6.5E-03	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	97.7 J	97.7	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	41.6	41.6	22000	N	1.9E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	4.2	4.2	26	N	1.6E-01	yes	No	maximum < SCTL
7440-02-0	NICKEL	2.1 J	2.1	28000	N	7.5E-05	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	180 J	180	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.62 J	0.62	9100	N	6.8E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	211 J	211	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	44.6	44.6	7400	N	6.0E-03	no	No	maximum < SCTL
7440-66-6	ZINC	10.2	10.2	560000	N	1.8E-05	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.12 J	0.12	39000	N	3.1E-06	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 7-8

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 13 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
13SS0201
13SS0302
13SS0503
13SS0503-AVG
13SS0503-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

8.0 SITE 14, SHORT-TERM SANITARY LANDFILL

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 14. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

8.1 SITE DESCRIPTION

Site 14 is approximately 3 acres in size and is located near the southeastern boundary of the facility. Site 14 is one of six sites (Site 9 through Site 14) comprising the area known as the Southeast Disposal Area. Site 14 was the primary sanitary landfill at NAS Whiting Field for 6 to 9 months during the latter part of 1978 and the early part of 1979. Landfilling operations ceased in this area in early 1979 because the high clay content of the soil resulted in the ponding of rainwater throughout the site. The disposal area was subsequently covered with soil, and pine trees were planted.

The approximate location of Site 14 is shown on Figure 1-2 of the 1999 RI report. No permanent surface water sources exist in the immediate vicinity of Site 14. However, surface drainage from Site 14 is toward an unlined, vegetated "Y” ditch, which is located approximately 400 feet east of the site. The "Y" ditch drains east toward Big Coldwater Creek, which is located 1.8 miles east of Site 14.

Currently, Site 14 is vegetated with native grasses and scrub oak interspersed between rows of planted pine trees. The central area has less dense vegetative cover revealing small areas of exposed surface soils. There are currently no buildings at Site 14. The site is vacant, unused land at this time.

8.2 SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATION FOR SOILS

The surface soil dataset for Site 14 consists of samples collected from three locations (14-SL-01 through 14-SL-03) during the 1992 Phase IIA investigation and from three locations (14SO01 through 14SO03) during the 1995 Phase IIB investigation. The Phase IIA samples were collected at locations where surface geophysical anomalies were interpreted to be present. Because the Phase IIA surface soil sample locations were biased based on geophysical anomalies, the Phase IIB surface soil samples were collected using a random sampling technique to more appropriately support the human health and ecological (potential exposure to terrestrial wildlife) risk assessments. The Phase IIB sampling involved using a systematic sampling method in which a point was chosen at random along a transect, and samples were collected at equidistant intervals thereafter. The Phase IIA and IIB surface soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

To characterize waste materials in the landfill, test pits were excavated at locations where geophysical anomalies identified potential locations of buried materials. The subsurface soil dataset for Site 14 consists of one sample collected from each of two test pits (TP-14-01 and TP-14-02) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from depth intervals of 5 to 6 and 11.5 to 12.5 feet bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 8-1 and 8-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Surface and subsurface soil sample locations are presented on Figure 3-2 of the 1999 RI report.

8.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 14. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and DEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 8-1 and 8-2, respectively.

8.3.1 Surface Soil

Two VOCs, two SVOCs, 19 inorganics, and cyanide were detected in six surface soil samples collected at Site 14. A comparison of maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 8-1. Also presented in Table 8-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Concentrations of all chemicals were less than the direct contact, risk based COPC screening levels with the exception of aluminum, arsenic, iron, manganese, and vanadium. Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria (Table 8-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 14. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 14 surface soils. Therefore, no chemicals were retained as COPCs for direct contact exposures to surface soil at the Site 14.

8.3.2 Subsurface Soil

Four VOCs, three SVOCs and 19 inorganics were detected in two subsurface soil samples collected at Site 14. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 8-2. Also presented in Table 8-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Concentrations of all chemicals were less than the direct contact, risk based COPC screening levels with the exception of aluminum, arsenic, iron, and vanadium. Although concentrations of aluminum, arsenic, iron, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 14. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 14 subsurface soils. Therefore, no chemicals were retained as COPCs for direct contact exposures to subsurface soil at the Site 14.

8.4 RISK CHARACTERIZATION

This section provides a characterization of the potential human health risks associated with the exposure to chemicals in the surface and subsurface soils at Site 14. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and proposed FDEP guidance. The results of the risk characterization are discussed below.

8.4.1 Risk Characterization Using USEPA Guidelines

No COPCs were retained for surface soil or subsurface soil at Site 14; therefore, no risks estimates were calculated for exposures to surface and subsurface soil at Site 14.

8.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 14 conducted using proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 8-3 through 8-6 and are discussed below.

8.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 8-3 presents a comparison of maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs. The maximum detected concentrations and EPCs for all chemicals were less than the Level 1 SCTLs with the exception of arsenic and vanadium. The maximum detected concentration of arsenic also exceeded three times the residential SCTL. However, please see the preceding discussions regarding arsenic and vanadium. No chemicals were retained as COCs for residential exposures to surface soil at Site 14.

As shown in Table 8-4 the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No potential COCs were identified in the Level 1 evaluation; consequently, Level 2 and Level 3 evaluations were not required.

8.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 8-5 presents a comparison of maximum detected concentrations and EPCs for subsurface soil to the FDEP residential SCTLs. The maximum detected concentrations and EPCs for all chemicals were less than the Level 1 SCTLs with the exception of arsenic and vanadium. The maximum detected concentration of arsenic and vanadium also exceeded three times the residential SCTLs. However, please see the preceding discussions regarding arsenic and vanadium. No chemicals were retained as COCs for residential exposures to subsurface soil at Site 14.

As shown in Table 8-6, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating that free product is not present in subsurface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No COCs were identified in the Level 1 evaluation; consequently, Level 2 and Level 3 evaluations were not required.

8.5 SITE-SPECIFIC UNCERTAINTLY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

8.5.1 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 14 were selected using available background concentrations for soil. Aluminum, arsenic, iron, manganese, and vanadium in surface soil and aluminum, arsenic, iron, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	23,800	14,900	72,000
Arsenic	4.3	4.5	0.8
Iron	15,800	18,800	23,000
Manganese	597	Not Applicable	1,600
Vanadium	42.1	47.7	15

The SCTLs presented for aluminum, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-third of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-fifth of the SCTL. The maximum detected concentration of iron in surface soil is approximately two-thirds of the SCTL, and the maximum detected concentration is subsurface soil is approximately four-fifths of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse non-cancer health effects. The maximum detected concentration of manganese in surface soil is approximately two-fifths of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 2.8 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 3.2 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the "pica" soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1×10^{-6} cancer risk level but not the 1×10^{-5} and 1×10^{-4} risk levels.

8.5.2 Limited Subsurface Soil Dataset

Six surface soil samples and two subsurface soil samples only were collected for chemical analysis during the field investigation at Site 14. However, the subsurface soil samples were collected from test pits excavated at locations where geophysical anomalies identified the potential locations of buried materials.

8.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in six surface soil and two subsurface soil samples collected at Site 14. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 14. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

No chemicals were selected as COPCs for surface or subsurface soil. Consequently, a quantitative HHRA (per USEPA guidelines) was not performed. Because no COPCs were identified, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment and cancer risks for the receptors of concern would not exceed the State of Florida cancer risk benchmark of 1×10^{-6} or the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. None of the chemicals detected in the Site 14 surface or subsurface soils were identified as potential COCs based on a comparison of maximum detected concentrations and EPCs to these SCTLs.

TABLE 8-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
75-09-2	METHYLENE CHLORIDE	2/6	0.006 J	0.008 J	0.006 - 0.012	14S00301	0.008	NA (13)	9.1 C	2	16 C	17	---	3	4.0E-03	No	BSL
1330-20-7	TOTAL XYLENES	1/6	0.002 J	0.002 J	0.005 - 0.012	14-SL-01	0.002	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	1200	7.4E-05	No	BSL
	Semivolatile Organics (mg/kg)																
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/6	0.04 J	0.04 J	0.35 - 0.38	14-SL-02	0.04	NA	35 C	6	76 C	72	---	15	6.7E-03	No	BSL
218-01-9	CHRYSENE	1/6	0.38 J	0.38 J	0.35 - 0.38	14-SL-02	0.38	NA	62 C	10	140 C	130	---	28	3.8E-02	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	6/6	10100	23800	---	14S00201	23800	no	76000 N	7600	72000 N	80000	Body Weight	**18000**	**3.1E+00**	No	BKG
7440-38-2	ARSENIC	6/6	1.5 J	4.3	---	14S00201	4.3	no	0.39 C	0.065	**0.80** C	2.1	---	**0.16**	**6.6E+01**	No	BKG
7440-39-3	BARIUM	6/6	6.2 J	26.6 J	---	14S00101-D	26.6	NE(14)	5400 N	540	110 N	120	Cardiovascular	110	4.9E-02	No	BSL
7440-41-7	BERYLLIUM	3/6	0.12 J	0.15 J	1	14-SL-01	0.15	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.0E-02	No	BSL
7440-43-9	CADMIUM	1/6	0.94 J	0.94 J	0.59 - 1	14-SL-02	0.94	NE	37 N	3.7	75 N	82	Kidney	75	2.5E-01	No	BSL
7440-70-2	CALCIUM	6/6	51.9 J	183 J	---	14S00101-D	183	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	6/6	5.9	19.6	---	14S00201	19.6	NE	210 C	35	210 C	210	---	42	5.6E-01	No	BSL
7440-48-4	COBALT	6/6	0.65 J	1.8 J	---	14-SL-03, 14S00101	1.8	NE	900 C	150	4,700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	940	1.2E-02	No	BSL
7440-50-8	COPPER	3/6	4.9 J	7.8	5	14-SL-03	7.8	NE	3100 N	310	110 N	150	Gastrointestinal	110	2.5E-02	No	BSL
7439-89-6	IRON	6/6	5470	15800	---	14-SL-02	15800	no	23000 N	2300	23000 N	53000	Blood, Gastrointestinal	**7670**	**6.9E+00**	No	BKG
7439-92-1	LEAD	6/6	4.3 J	11.9 J	---	14S00101-D	11.9	NE	400	400	400	400	---	400	3.0E-02	No	BSL
7439-95-4	MAGNESIUM	6/6	48.6 J	177 J	---	14S00101	177	NE	---	---	---	---	---	---		No	NUT
7439-96-5	MANGANESE	6/6	33.6	597 J	---	14S00101-D	597	no	1800 N	180	1600 N	3500	Neurological	**320**	**3.3E+00**	No	BKG
7439-97-6	MERCURY	3/6	0.02 J	0.04 J	0.08 - 0.09	14S00101, 14S00101-D, 14S00301	0.04	NE	23 N	2.3	3.4 N	3	Neurological	0.68	1.7E-02	No	BSL
7440-02-0	NICKEL	3/6	3.5 J	5 J	2.3 - 2.4	14S00201	5	NE	1600 N	160	110 N	340	Body Weight	110	3.1E-02	No	BSL
7440-09-7	POTASSIUM	2/6	144 J	174 J	129 - 1000	14S00201	174	NE	---	---	---	---	---	---	---	No	NUT
7440-23-5	SODIUM	3/6	170 J	180 J	1000	14-SL-03	180	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	6/6	14.1	42.1	---	14-SL-02	42.1	no	550 N	55	**15** N	67	NOEL	**15**	7.7E-01	No	BKG
7440-66-6	ZINC	3/6	7.7 J	11.1	4	14-SL-02	11.1	NE	23000 N	2300	23000 N	26000	Blood	11500	4.8E-03	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	1/6	0.07 J	0.07 J	0.24 - 0.5	14S00101	0.07	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	5.8E-04	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 8-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 6 chemicals detected in surface soil at Site 14 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 6. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 5 carcinogens were detected in surface soil at Site 14. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 5. For noncarcinogens, neurological effects were identified as the target organ for 5 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 5. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:
14-SL-01
14-SL-02
14-SL-03
14S00101
14S00101-D
14S00201
14S00301

TABLE 8-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
67-64-1	ACETONE	1/2	0.17 J	0.17 J	0.072	14SS0202	0.17	NA (13)	1600	N	160	780	N	11000	Kidney, Liver, Neurological	110	2.2E-04	No	BSL
100-41-4	ETHYLBENZENE	1/2	0.5	0.5	0.012	14SS0202	0.5	NA	400	sat	400	1100	N	1500	Developmental, Kidney, Liver	280	4.5E-04	No	BSL
108-88-3	TOLUENE	1/2	0.023 J	0.023 J	0.012	14SS0202	0.023	NA	520	sat	520	380	N	7500	Kidney, Liver, Neurological	54	6.1E-05	No	BSL
1330-20-7	TOTAL XYLENES	1/2	0.26 J	0.26 J	0.012	14SS0202	0.26	NA	270	N	27	5900	N	130	Body Weight, Mortality, Neurological	840	4.4E-05	No	BSL
	Semivolatile Organics (mg/kg)																		
106-44-5	4-METHYLPHENOL	1/2	0.06 J	0.06 J	0.41	14SS0202	0.06	NA	310	N	31	250	N	300	Maternal Death, Neurological, Respiratory	36	2.4E-04	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/2	0.29 J	0.29 J	0.41	14SS0202	0.29	NA	35	C	9	76	C	72	---	25	3.8E-03	No	BSL
91-20-3	NAPHTHALENE	1/2	1.5	1.5	0.41	14SS0202	1.5	NA	56	N	5.6	40	N	55	Body Weight, Nasal	10	3.8E-02	No	BSL
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	2/2	8830	14900	---	14SS0101	14900	no	76000	N	**7600**	72000	N	80000	Body Weight	18000	2.1E-01	No	BKG
7440-38-2	ARSENIC	2/2	3.7	4.5	---	14SS0101	4.5	no	0.39	C	**0.1**	0.8	C	2.1	---	**0.27**	**5.6E+00**	No	BKG
7440-39-3	BARIUM	2/2	7.7 J	7.9 J	---	14SS0101	7.9	NE(14)	5400	N	540	110	N	120	Cardiovascular	110	7.2E-02	No	BSL
7440-41-7	BERYLLIUM	2/2	0.2 J	0.21 J	---	14SS0101	0.21	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.8E-03	No	BSL
7440-43-9	CADMIUM	1/2	1.7	1.7	0.68	14SS0202	1.7	NE	37	N	3.7	75	N	82	Kidney	75	2.3E-02	No	BSL
7440-70-2	CALCIUM	2/2	126 J	256 J	---	14SS0202	256	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	CHROMIUM	2/2	18.4	18.6	---	14SS0101	18.6	NE	210	C	53	210	C	210	---	70	8.9E-02	No	BSL
7440-48-4	COBALT	2/2	1.4 J	1.8 J	---	14SS0101	1.8	NE	900	C	225	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	671	3.8E-04	No	BSL
7440-50-8	COPPER	2/2	4.6 J	7.5	---	14SS0101	7.5	NE	3100	N	310	110	N	150	Gastrointestinal	110	6.8E-02	No	BSL
7439-89-6	IRON	2/2	15300	18800	---	14SS0101	18800	no	23000	N	**2300**	23000	N	53000	Blood, Gastrointestinal	**7670**	8.2E-01	No	BKG
7439-92-1	LEAD	2/2	5.6	7.3	---	14SS0101	7.3	NE	400		400	400		400	---	400	1.8E-02	No	BSL
7439-95-4	MAGNESIUM	2/2	71.6 J	104 J	---	14SS0101	104	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	2/2	23.4	35	---	14SS0101	35	no	1800	N	180	1600	N	3500	Neurological	229	2.2E-02	No	BSL,BKG
7439-97-6	MERCURY	2/2	0.12 J	0.14 J	---	14SS0202	0.14	NE	23	N	2.3	3.4	N	3	Neurological	0.49	4.1E-02	No	BSL
7440-02-0	NICKEL	2/2	3.1 J	3.6 J	---	14SS0202	3.6	NE	1600	N	160	110	N	340	Body Weight	110	3.3E-02	No	BSL
7440-22-4	SILVER	1/2	0.5 J	0.5 J	0.45	14SS0202	0.5	NE	390	N	39	390	N	410	Skin	390	1.3E-03	No	BSL
7440-23-5	SODIUM	2/2	169 J	190 J	---	14SS0202	190	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	2/2	38.8	47.7	---	14SS0101	47.7	no	550	N	55	15	N	67	NOEL	**15**	**3.2E+00**	No	BKG
7440-66-6	ZINC	2/2	9.8 J	15.4	---	14SS0202	15.4	NE	23000	N	2300	23000	N	26000	Blood	11500	6.7E-04	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 8-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 Residential PRGs (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 4 chemicals detected in subsurface soil at Site 14 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 4. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Value sof the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 3 carcinogens were detected in subsurface soil at Site 14. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 3. For noncarcinogens, neurological effects were identified as the target organ for 7 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 7. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
14SS0101
14SS0202

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 8-3

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
75-09-2	METHYLENE CHLORIDE	0.008 J	0.008	16	C	5.0E-04	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.002 J	0.002	5900	N	3.4E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.04 J	0.04	76	C	5.3E-04	NA	No	maximum < SCTL
218-01-9	CHRYSENE	0.38 J	0.38	140	C	2.7E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	23800	23800	72000	N	3.3E-01	no	No	(8)
7440-38-2	ARSENIC	4.3	4.3	0.8	C	**5.4E+00**	no	No	(8)
7440-39-3	BARIUM	26.6 J	26.6	110	N	2.4E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.15 J	0.15	120	N	1.3E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	0.94 J	0.94	75	N	1.3E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	183 J	183	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	19.6	19.6	210	C	9.3E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1.8 J	1.8	4700	N	3.8E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	7.8	7.8	110	N	7.1E-02	NE	No	maximum < SCTL
7439-89-6	IRON	15800	15800	23000	N	6.9E-01	no	No	(8)
7439-92-1	LEAD	11.9 J	6.07	400		3.0E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	177 J	177	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	597 J	597	1600	N	3.7E-01	no	No	(8)
7439-97-6	MERCURY	0.04 J	0.04	3.4	N	1.2E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	5 J	5	110	N	4.5E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	174 J	174	---		---	NE	No	Essential Nutrient
7440-23-5	SODIUM	180 J	180	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	42.1	42.1	15	N	**2.8E+00**	no	No	(8)
7440-66-6	ZINC	11.1	11.1	23000	N	4.8E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.07 J	0.07	30	N	2.3E-03	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 8-3

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 14 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
14-SL-01
14-SL-02
14-SL-03
14S00101
14S00101-D
14S00201
14S00301

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 8-4

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
75-09-2	METHYLENE CHLORIDE	2/6	0.008 J	0.008	14S00301	NA (5)	2400
1330-20-7	TOTAL XYLENES	1/6	0.002 J	0.002	14-SL-01	NA	140
	Semivolatile Organics (mg/kg)						
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/6	0.04 J	0.04	14-SL-02	NA	31000
218-01-9	CHRYSENE	1/6	0.38 J	0.38	14-SL-02	NA	3.8

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

14-SL-01	14S00101-D
14-SL-02	14S00201
14-SL-03	14S00301
14S00101	

TABLE 8-5

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
67-64-1	ACETONE	0.17 J	0.17	780 N	2.2E-04	NA (6)	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.5	0.5	1100 N	4.5E-04	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.023 J	0.023	380 N	6.1E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.26 J	0.26	5900 N	4.4E-05	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
106-44-5	4-METHYLPHENOL	0.06 J	0.06	250 N	2.4E-04	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.29 J	0.29	76 C	3.8E-03	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	1.5	1.5	40 N	3.8E-02	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	14900	14900	72000 N	2.1E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	4.5	4.5	0.8 C	**5.6E+00**	no	No	(8)
7440-39-3	BARIUM	7.9 J	7.9	110 N	7.2E-02	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.21 J	0.21	120 N	1.8E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	1.7	1.7	75 N	2.3E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	256 J	256	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	18.6	18.6	210 C	8.9E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1.8 J	1.8	4700 N	3.8E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	7.5	7.5	110 N	6.8E-02	NE	No	maximum < SCTL
7439-89-6	IRON	18800	18800	23000 N	8.2E-01	no	No	maximum < SCTL
7439-92-1	LEAD	7.3	6.45	400	1.8E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	104 J	104	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	35	35	1600 N	2.2E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.14 J	0.14	3.4 N	4.1E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	3.6 J	3.6	110 N	3.3E-02	NE	No	maximum < SCTL
7440-22-4	SILVER	0.5 J	0.5	390 N	1.3E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	190 J	190	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	47.7	47.7	15 N	**3.2E+00**	no	No	(8)
7440-66-6	ZINC	15.4	15.4	23000 N	6.7E-04	NE	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 8-5

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 14 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
14SS0101
14SS0202

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 8-6

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
67-64-1	ACETONE	1/2	0.17 J	0.17	14SS0202	NA (5)	100000
100-41-4	ETHYLBENZENE	1/2	0.5	0.5	14SS0202	NA	400
108-88-3	TOLUENE	1/2	0.023 J	0.023	14SS0202	NA	650
1330-20-7	TOTAL XYLENES	1/2	0.26 J	0.26	14SS0202	NA	140
	Semivolatile Organics (mg/kg)						
106-44-5	4-METHYLPHENOL	1/2	0.06 J	0.06	14SS0202	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1/2	0.29 J	0.29	14SS0202	NA	31000
91-20-3	NAPHTHALENE	1/2	1.5	1.5	14SS0202	NA	220

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:
14SS0101
14SS0202

9.0 SITE 15, SOUTHWEST LANDFILL

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 15. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

9.1 SITE DESCRIPTION

Site 15 is 21 acres in size and is located along the southwestern facility boundary near the South Air Field. The site topography slopes at about 5 percent to the southwest towards Clear Creek, located approximately 1,200 feet southwest of the site. The Initial Assessment Study (IAS) report noted soil erosion had exposed numerous areas of buried waste (Envirodyne Engineers, Inc., 1985).

Site 15 was an operational landfill from 1965 to 1979 and consisted of approximately seven trenches oriented north-northeast. These trenches covered approximately 15 of the 21 acres of the site. The landfill reportedly received the majority of waste generated at NAS Whiting Field, potentially including general refuse, waste paints, oils, solvents, thinner, hydraulic fluid, bagged asbestos, and potentially PCB-contaminated transformer oil. It is estimated approximately 3,000 to 4,500 tons of waste were disposed at the site annually. Burning of waste material was not conducted, and waste was covered on a daily basis. At the time of the RI fieldwork, buried wastes were not typically exposed at the land surface, and there were no indications (e.g., stained soil or stressed vegetation) of other past waste disposal practices (HLA, 1999).

The approximate location of Site 15 is shown on Figure 1-2 of the 1999 RI report. Currently, the site is covered with sparse native grasses and scrub oak vegetative cover and with planted pine trees approximately 20 to 30 feet in height. There are currently no buildings at the site. Site 15 is vacant, unused land at this time.

9.2 FIELD INVESTIGATION SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATION FOR SOILS

A surface soil assessment was conducted during the RI of Site 15 in two phases (Phase IIA and IIB). Phase IIA included the collection of soil samples from five locations (15-SL-01 through 15-SL-05) during 1992. The Phase IIB investigation included the collection of soil samples from 24 locations (15-SO01 through 15-SO25, not including 15-SO15). The Phase IIA samples were collected at locations where surface geophysical anomalies were interpreted to be present. Because the Phase IIA surface soil sample locations were biased based on geophysical anomalies, the Phase IIB surface soil samples were collected using a random sampling technique to more appropriately support the HHRA. The Phase IIB sampling involved using a systematic sampling method in which a point was chosen at random along a transect and samples were collected at equidistant intervals thereafter. A subsequent removal action at Site 15 excavated the soils at location 15SO1501; therefore, the sample from this location is not included in the surface soil dataset considered for the HHRA. The Phase IIA and IIB surface soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

To characterize waste materials within the landfill, test pits were excavated at locations where geophysical anomalies identified potential locations of buried materials. The subsurface soil dataset for Site 15 consists of one sample from each of five test pits (TP-15-02, TP-15-05, TP-15-06, TP-15-08, and TP-15-10) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from depth intervals of 5 to 6 feet or 10 to 12 feet bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 9-1 and 9-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Surface and subsurface soil sample locations are presented on Figures 3-2 and 3-3 of the 1999 RI report.

9.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 15. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 9-1 and 9-2, respectively.

9.3.1 Surface Soil

Three VOCs, three SVOCs, three pesticides, 20 inorganics, and cyanide were detected in 29 surface soil samples collected at Site 15. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 9-1. Also presented in Table 9-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Concentrations of all chemicals were less than the direct contact, risk based COPC screening levels with the exception of aluminum, arsenic, iron, and vanadium. Although concentrations of aluminum, arsenic, iron, and vanadium in surface soil exceeded the screening criteria (Table 9-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field landfills are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 15. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 15 surface soils. Therefore, no chemicals were retained as COPCs for direct contact exposures to surface soil at the Site 15.

9.3.2 Subsurface Soil

Three VOCs, seven SVOCs, two pesticides/PCBs, 20 inorganics, and cyanide were detected in five subsurface soil samples collected at Site 15. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 9-2. Also presented in Table 9-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A. Aroclor-1242 and mercury were the only chemicals detected at concentrations in excess of direct contact, risk based COPC screening levels and background concentrations, and were retained as COPCs for subsurface soil at Site 15. Concentrations of aluminum, arsenic, iron, and vanadium also exceeded the screening. Although concentrations of aluminum, arsenic, iron, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 15. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 15 subsurface soils.

Concentrations of Aroclor-1242 exceeded the simple apportioned and non-apportioned PRGs and SCTLs. Concentrations of mercury exceeded the simple apportioned SCTL but were less than the non-apportioned PRG and SCTL and the simple apportioned PRG.

9.4 RISK CHARACTERIZATION

This section provides a characterization of potential human health risks associated with potential exposures to chemicals in surface and subsurface soils at Site 15. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

9.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 15 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs. Potential risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 9-3. The results are discussed below. Chemical-specific risks for Site 15 are presented in Appendix B. No COPCs were retained for surface soil at Site 15; therefore, risks were only calculated for exposures to subsurface soil.

Non-carcinogenic Risk

Cumulative HIs estimated for exposures by residents to subsurface soil (HI = 2) exceeded 1. Aroclor-1242 (HQ = 2) was the major contributor to the HI; the HI for mercury was 0.2. Cumulative HIs for construction workers and industrial workers were less than 1, indicating adverse, non-carcinogenic effects are not anticipated for these receptors under the conditions defined for the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to subsurface soil were less than or within USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for all receptors. However, the ILCR for residents hypothetically exposed to subsurface soil exceeded the FDEP target level of 1×10^{-6}. The chemical-specific ILCR for Aroclor-1242, the only carcinogen selected as a COPC, exceeded 1×10^{-6} for exposures to subsurface soil by residents.

9.4.2 Risk Characterization Using Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 15 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 9-4 through 9-8 and are discussed below.

9.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 9-4 presents a comparison of maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs. Maximum detected concentrations and EPCs for all chemicals were less than Level 1 SCTLs with the exception of arsenic and vanadium. The maximum detected concentration of arsenic also exceeded three times the residential SCTLs. However, please see the preceding discussion regarding arsenic and vanadium (Section 9.3.1). No chemicals were retained as COCs for residential exposures to surface soil at Site 15.

As shown in Table 9-5 the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No COCs were identified in the Level 1 evaluation; consequently, Level 2 and Level 3 evaluations were not required.

9.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 9-6 presents a comparison of maximum detected concentrations and EPCs for subsurface soil to FDEP residential SCTLs. The following chemical was identified as exceeding the Level 1 SCTLs and was retained as a potential COC for residential exposures to subsurface soil at Site 15:

- Aroclor-1242

The maximum concentrations and EPCs for arsenic and vanadium exceeded the Level 1 criteria. The maximum detected concentration of arsenic also exceeded three times the residential SCTL. However, please see the preceding discussions regarding arsenic and vanadium (Section 9.3.2). Arsenic and vanadium were not retained as COCs for residential exposures to subsurface soil at the Site 15.

As shown in Table 9-7, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating that free product is not present in subsurface soil.

Level 2 (Industrial) Evaluation

The results of the Level 1 evaluation identified Aroclor-1242 as a potential COC; therefore, a Level 2 evaluation was conducted. Table 9-8 presents a comparison of maximum detected concentrations and EPCs for subsurface soil to FDEP industrial SCTLs. The following chemical was identified as exceeding the Level 2 SCTLs and was retained as a potential COC for industrial exposures to subsurface soil at Site 15:

- Aroclor-1242

The maximum detected Aroclor-1242 concentration (2.2 mg/kg) marginally exceeds the current SCTL for the industrial land use scenario (2.1 mg/kg) and would not exceed the proposed SCTL for the industrial land use scenario (2.6 mg/kg).

Level 3 (Recreational) Evaluation

The results of the Level 2 evaluation identified Aroclor-1242 as a potential COC; therefore, a Level 3 evaluation was conducted. Alternatives CTLs for recreational exposures were derived following the methodology presented in Section 2. The maximum detected Aroclor-1242 concentration (2.2 mg/kg) does not exceed the alternative CTL for recreational land use (6.2 mg/kg). Therefore, no chemicals were selected as potential COCs for the recreational land use scenario.

9.5 SITE-SPECIFIC UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

9.5.1 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 15 were selected using available background concentrations for soil. Aluminum, arsenic, iron, and vanadium in surface soil and subsurface soil were eliminated as COPCs on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		DEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	13,700	15,100	72,000
Arsenic	4.3	2.6	0.8
Iron	11,900	9,640	23,000
Vanadium	35.9	25	15

The SCTLs presented for aluminum, iron, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentrations of aluminum in surface soil and subsurface soil are approximately one-fifth of the SCTL. The maximum detected concentration of iron in surface soil is approximately one-half of the SCTL, and the maximum detected concentration is subsurface soil is approximately two-fifths of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse non-cancer health effects. The maximum detected concentration of vanadium in surface soil is approximately 2.4 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 1.7 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1 x 10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1 x 10^{-5} and 1 x 10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the value presented for the 1 x 10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1 x 10^{-6} cancer risk level, but not the 1 x 10^{-5} and 1 x 10^{-4} risk levels.

9.5.2 Limited Subsurface Soil Dataset

Five subsurface soil samples only were collected for chemical analysis during the field investigation at Site 15. However, the subsurface soil samples were collected from test pits excavated at locations where geophysical anomalies identified the potential locations of buried materials.

9.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in 29 surface soil and five subsurface soil samples collected at Site 15. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation route of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 15. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

No chemicals were selected as COPCs for surface soil. Aroclor-1242 and mercury were selected as COPCs for subsurface soil, and quantitative risk estimates were calculated for three future receptors (i.e., resident, typical industrial worker, and construction worker) per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) for the hypothetical future resident exposed to subsurface soil exceeded 1 for Aroclor-1242 indicating a potential for adverse, non-carcinogenic health effects under the conditions established in the exposure assessment. The non-cancer risk estimates (i.e., HIs) for the typical industrial worker or the construction worker did not exceed 1. The cancer risk estimate developed for the future resident hypothetically exposed to Aroclor-1242 in subsurface soils exceeded the State of Florida cancer risk benchmark of 1×10^{-6}. However, cancer risk estimates for the typical industrial worker and the construction worker did not, and none of the cancer risk estimates exceeded the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. Risk estimates for mercury did not exceed USEPA or State of Florida risk benchmarks.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. No chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations and EPCs to these SCTLs. Aroclor-1242 was selected as a potential COC for subsurface soils based on the comparison of the maximum detected concentrations and EPC to the relevant residential and industrial SCTLs. The maximum detected Aroclor-1242 concentration (2.2 mg/kg) marginally exceeds the current SCTL for the industrial land use scenario (2.1 mg/kg) and would not exceed the proposed SCTL for the industrial land use scenario (2.6 mg/kg). Aroclor-1242 was detected in only one of the five subsurface soil samples submitted for chemical analysis for the RI.

TABLE 9-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
67-64-1	ACETONE	1/29	0.011 J	0.011 J	0.01 - 0.022	15S02101	0.011	NA (13)	1600	N	160	780	N	11000	Kidney, Liver, Neurological	110	1.4E-05	No	BSL, FREQ
75-09-2	METHYLENE CHLORIDE	4/29	0.003 J	0.009	0.005 - 0.012	15S02101	0.009	NA	9.1	C	1.1	16	C	17	---	2	5.6E-04	No	BSL
1330-20-7	TOTAL XYLENES	3/29	0.001 J	0.004 J	0.005 - 0.012	15-SL-04	0.004	NA	270	N	27	5900	N	130	Body Weight, Mortality, Neurological	840	6.8E-07	No	BSL
	Semivolatile Organics (mg/kg)																		
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/29	0.039 J	1.7	0.35 - 0.43	15S00101-D	1.7	NA	35	C	4	76	C	72	---	11	2.2E-02	No	BSL
85-68-7	BUTYL BENZYL PHTHALATE	1/29	0.24 J	0.24 J	0.35 - 0.43	15S00201	0.24	NA	12000	N	1200	15000	N	17000	Liver	7500	1.6E-05	No	BSL, FREQ
84-74-2	DI-N-BUTYL PHTHALATE	6/29	0.56	1.1	0.35 - 0.41	15S00201	1.1	NA	6100	N	610	7300	N	8200	Mortality	3700	1.5E-04	No	BSL
	Pesticides PCBs (mg/kg)											0		0					
72-54-8	4,4'-DDD	1/29	0.0038	0.0038	0.0035 - 0.018	15S01101	0.0038	NA	2.4	C	0.30	4.6	C	4.2	---	0.7	8.3E-04	No	BSL
72-55-9	4,4'-DDE	3/29	0.0019 J	0.05	0.0035 - 0.018	15S01101	0.05	NA	1.7	C	0.21	3.3	C	2.9	---	0.5	1.5E-02	No	BSL
50-29-3	4,4'-DDT	2/29	0.0044	0.014	0.0035 - 0.018	15S01101	0.014	NA	1.7	C	0.21	3.3	C	2.9	---	0.5	4.2E-03	No	BSL
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	29/29	3280	13700	---	15S01701	13700	no	76000	N	7600	72000	N	80000	Body Weight	18000	1.9E-01	No	BKG
7440-38-2	ARSENIC	29/29	0.75 J	4.3	---	15S01701-D	4.3	no	0.39	C	0.05	0.8	C	2.1	---	0.11	5.4E+00	No	BKG
7440-39-3	BARIUM	29/29	3.2 J	11.4 J	---	15S01201	11.4	NE (14)	5400	N	540	110	N	120	Cardiovascular	110	1.0E-01	No	BSL
7440-41-7	BERYLLIUM	3/29	0.07 J	0.09 J	0.05 - 1	15-SL-04	0.09	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	7.5E-04	No	BSL
7440-70-2	CALCIUM	17/29	20.4 J	137 J	1000	15-SL-02	137	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	CHROMIUM	29/29	2.8	14.8	---	15S01701	14.8	NE	210	C	26	210	C	210	---	30	7.0E-02	No	BSL
7440-48-4	COBALT	11/29	0.49 J	1.2 J	0.33 - 10	15-SL-01	1.2	NE	900	C	113	4700	N	1700	Cardiovascular, Immunological, Neurological, Reproductive	671	2.6E-04	No	BSL
7440-50-8	COPPER	7/29	1.6 J	12.5	5	15-SL-05	12.5	NE	3100	N	310	110	N	150	Gastrointestinal	110	1.1E-01	No	BSL
7439-89-6	IRON	29/29	1610 J	11900 J	---	15S01701	11900	no	23000	N	2300	23000	N	53000	Blood, Gastrointestinal	7670	5.2E-01	No	BKG
7439-92-1	LEAD	29/29	2.3	59.9	---	15-SL-05	59.9	NE	400		400	400		400	---	400	1.5E-01	No	BSL
7439-95-4	MAGNESIUM	29/29	41.8 J	156 J	---	15S00901	156	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	29/29	6.8	143	---	15-SL-04	143	no	1800	N	180	1600	N	3500	Neurological	229	8.9E-02	No	BSL,BKG
7439-97-6	MERCURY	20/28	0.01 J	0.19	0.06 - 0.1	15S01201	0.19	NE	23	N	2.3	3.4	N	3	Neurological	0.49	5.6E-02	No	BSL
7440-02-0	NICKEL	1/29	3.3 J	3.3 J	2.3 - 8	15S02201	3.3	NE	1600	N	160	110	N	340	Body Weight	110	3.0E-02	No	BSL, FREQ
7440-09-7	POTASSIUM	5/29	131	201 J	128 - 1000	15S01801	201	NE	---		---	---		---	---	---	---	No	NUT
7782-49-2	SELENIUM	5/29	0.24 J	0.3 J	0.39 - 1	15S01901	0.3	NE	390	N	39	390	N	440	Hair Loss, Neurological, Skin	55.7	7.7E-04	No	BSL
7440-22-4	SILVER	4/29	0.66 J	2 J	0.32 - 2	15S01201	2	NE	390	N	39	390	N	410	Skin	195	5.1E-03	No	BSL
7440-23-5	SODIUM	5/29	170 J	179 J	1000	15-SL-05	179	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	29/29	4.1 J	35.9	---	15S01701	35.9	no	550	N	55	15	N	67	NOEL	15	2.4E+00	No	BKG
7440-66-6	ZINC	27/29	2.4 J	15.9	4	15S01201	15.9	NE	23000	N	2300	23000	N	26000	Blood	11500	6.9E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																		
57-12-5	CYANIDE	2/29	0.16 J	0.31 J	0.24 - 0.5	15S00701	0.31	NA	1200	N	120	30	N	34	Body Weight, Neurological, Thyroid	30	1.0E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 9-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 8 chemicals detected in surface soil at Site 15 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 8. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 7 carcinogens were detected in surface soil at Site 15. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 7. For noncarcinogens, neurological effects were identified as the target organ for 7 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 7. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

15S00101	15S01101	15S02001-D
15S00101-AVG	15S01201	15S02101
15S00101-D	15S01301	15S02201
15S00201	15S01401	15S02301
15S00301	15S01601	15S02401
15S00401	15S01701	15S02501
15S00501	15S01701-AVG	15-SL-01
15S00601	15S01701-D	15-SL-02
15S00701	15S01801	15-SL-03
15S00801	15S01901	15-SL-04
15S00901	15S02001	15-SL-05
15S01001	15S02001-AVG	

TABLE 9-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
591-78-6	2-HEXANONE	1/5	0.003 J	0.003 J	0.011	15SS0201	0.003	NA (13)	---	---	5.1 N	24	none specified	3	5.9E-04	No	BSL
108-90-7	CHLOROBENZENE	1/5	0.002 J	0.002 J	0.011	15SS0804	0.002	NA	150 N	15	30 N	120	Liver	30	6.7E-05	No	BSL
1330-20-7	TOTAL XYLENES	4/5	0.004 J	0.006 J	0.011	15SS1005	0.006	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	840	1.0E-06	No	BSL
	Semivolatile Organics (mg/kg)																
106-46-7	1,4-DICHLOROBENZENE	1/5	0.11 J	0.11 J	0.35 - 0.36	15SS0804	0.11	NA	3.4 C	0.49	6 C	6.4	---	1	1.8E-02	No	BSL
91-57-6	2-METHYLNAPHTHALENE	2/5	0.068 J	0.076 J	0.35 - 0.36	15SS0804	0.076	NA	56 N	5.6	80 N	210	Body Weight, Nasal	11	9.5E-04	No	BSL
106-44-5	4-METHYLPHENOL	2/5	0.042 J	0.077 J	0.35 - 0.37	15SS0603	0.077	NA	310 N	31	250 N	300	Maternal Death, Neurological, Respiratory	42	3.1E-04	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/5	0.042 J	0.23 J	0.35 - 0.37	15SS0603	0.23	NA	35 C	5	76 C	72	---	13	3.0E-03	No	BSL
84-66-2	DIETHYL PHTHALATE	1/5	0.041 J	0.041 J	0.35 - 0.37	15SS0201	0.041	NA	49000 N	4900	54000 N	61000	Body Weight	7700	7.6E-07	No	BSL
91-20-3	NAPHTHALENE	2/5	0.092 J	0.14 J	0.35 - 0.36	15SS0603	0.14	NA	56 N	5.6	40 N	55	Body Weight, Nasal	6	3.5E-03	No	BSL
108-95-2	PHENOL	1/5	0.053 J	0.053 J	0.35 - 0.37	15SS0201	0.053	NA	37000 N	3700	900 N	500	Developmental	900	5.9E-05	No	BSL
	Pesticides PCBs (mg/kg)																
72-55-9	4,4'-DDE	1/5	0.0023 J	0.0023 J	0.0035 - 0.037	15SS1005	0.0023	NA	1.7 C	0.24	3.3 C	2.9	---	0.6	7.0E-04	No	BSL
53469-21-9	**AROCLOR-1242**	1/5	2.2	2.2	0.035 - 0.036	15SS0804	2.2	NA	0.22 C	**0.03**	0.5 C	0.5	---	**0.083**	**4.4E+00**	**Yes**	**ASL**
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	5/5	3520	15100	---	15SS0804	15100	no	76000 N	**7600**	72000 N	80000	Body Weight	**10300**	2.1E-01	No	BKG
7440-38-2	ARSENIC	5/5	0.63 J	2.6	---	15SS0201, 15SS0804	2.6	no	0.39 C	**0.06**	0.8 C	2.1	---	**0.13**	**3.3E+00**	No	BKG
7440-39-3	BARIUM	5/5	1.6 J	13.2 J	---	15SS0804	13.2	NE (14)	5400 N	540	110 N	120	Cardiovascular	110	1.2E-01	No	BSL
7440-41-7	BERYLLIUM	4/5	0.09 J	0.17 J	0.05	15SS0201	0.17	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.4E-03	No	BSL
7440-43-9	CADMIUM	1/5	2.1	2.1	0.63 - 0.66	15SS0603	2.1	NE	37 N	3.7	75 N	82	Kidney	75	2.8E-02	No	BSL
7440-70-2	CALCIUM	5/5	72.7 J	267 J	---	15SS0804	267	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	5/5	3.8	12.7	---	15SS0804	12.7	NE	210 C	30	210 C	210	---	35	6.0E-02	No	BSL
7440-48-4	COBALT	1/5	0.71 J	0.71 J	0.71 - 0.73	15SS0201	0.71	NE	900 C	129	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	783	1.5E-04	No	BSL
7440-50-8	COPPER	5/5	0.86 J	6.8	---	15SS0804	6.8	NE	3100 N	310	110 N	150	Gastrointestinal	110	6.2E-02	No	BSL
7439-89-6	IRON	5/5	2100	9640	---	15SS0804	9640	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7670**	4.2E-01	No	BKG
7439-92-1	LEAD	5/5	2.8	86.2	---	15SS1005	86.2	NE	400	400	400	400	---	400	2.2E-01	No	BSL
7439-95-4	MAGNESIUM	5/5	18.8 J	109 J	---	15SS0603	109	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	5/5	10	44.2	---	15SS0804	44.2	no	1800 N	180	1600 N	3500	Neurological	267	2.8E-02	No	BSL,BKG
7439-97-6	**MERCURY**	5/5	0.09 J	0.59	---	15SS0804	0.59	yes	23 N	2.3	3.4 N	3	Neurological	**0.57**	1.7E-01	**Yes**	**ASL**
7440-02-0	NICKEL	3/5	2.1 J	3 J	1.1 - 1.2	15SS1005	3	NE	1600 N	160	110 N	340	Body Weight	110	2.7E-02	No	BSL
7440-09-7	POTASSIUM	3/5	137 J	157 J	145	15SS0603	157	NE	---	---	---	---	---	---	---	No	NUT
7440-22-4	SILVER	3/5	0.48 J	0.62 J	0.43	15SS0804	0.62	NE	390 N	39	390 N	410	Skin	390	1.6E-03	No	BSL
7440-23-5	SODIUM	5/5	165 J	191 J	---	15SS0804	191	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	5/5	6.5 J	25	---	15SS0804	25	no	550 N	55	15 N	67	NOEL	**15**	1.7E+00	No	BKG
7440-66-6	ZINC	5/5	3.1 J	19.1	---	15SS0804	19.1	NE	23000 N	2300	23000 N	26000	Blood	11500	8.3E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	1/4	0.55 J	0.55 J	0.09	15SS0603	0.55	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	1.8E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 9-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 7 chemicals detected in subsurface soil at Site 15 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 7. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 6 carcinogens were detected in subsurface soil at Site 15. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 6. For noncarcinogens, neurological effects were identified as the target organ for 6 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 6. Note that the non-apportioned SCTLs for phenol, barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:
15SS0201
15SS0502
15SS0603
15SS0804
15SS1005

TABLE 9-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 15, SOUTHWEST LANDFILL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	4E-06	- -	- -	Aroclor-1254	2	Aroclor-1254
Industrial Workers	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	1E-06	- -	- -	- -	0.3	- -
Construction Workers	Surface Soil	NE	- -	- -	- -	NE	- -
	Subsurface Soil	4E-07	- -	- -	- -	0.5	- -
Maintenance Workers	Surface Soil	NE	- -	- -	- -	NE	- -
Adolescent Recreational Users	Surface Soil	NE	- -	- -	- -	NE	- -
Adult Recreational Users	Surface Soil	NE	- -	- -	- -	NE	- -
Lifelong Recreational Users	Surface Soil	NE	- -	- -	- -	NA	- -

Notes:
NE - Not evaluated. There were no COPCs identified for surface soil.
NA - Not applicable.
HI - Hazard Index.

TABLE 9-4

FLORIDA LEVEL 1 DIRECT CONTACT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
67-64-1	ACETONE	0.011 J	0.006	780 N	1.4E-05	NA (6)	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.009	0.005	16 C	5.6E-04	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.004 J	0.004	5900 N	6.8E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1.7	0.2	76 C	2.2E-02	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.24 J	0.2	15000 N	1.6E-05	NA	No	maximum < SCTL
84-74-2	DI-N-BUTYL PHTHALATE	1.1	0.4	7300 N	1.5E-04	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.0038	0.0038	4.6 C	8.3E-04	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.05	0.007	3.3 C	1.5E-02	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.014	0.005	3.3 C	4.2E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	13700	7890	72000 N	1.9E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	4.3	1.7	0.8 C	**5.4E+00**	no	No	(8)
7440-39-3	BARIUM	11.4 J	7.2	110 N	1.0E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.09 J	0.09	120 N	7.5E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	137 J	137	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	14.8	6.9	210 C	7.0E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1.2 J	1.2	4700 N	2.6E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	12.5	3.9	110 N	1.1E-01	NE	No	maximum < SCTL
7439-89-6	IRON	11900 J	4770	23000 N	5.2E-01	no	No	maximum < SCTL
7439-92-1	LEAD	59.9	6.48	400	1.5E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	156 J	100	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	143	78.5	1600 N	8.9E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.19	0.039	3.4 N	5.6E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	3.3 J	3.3	110 N	3.0E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	201 J	201	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.3 J	0.3	390 N	7.7E-04	NE	No	maximum < SCTL
7440-22-4	SILVER	2 J	0.98	390 N	5.1E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	179 J	179	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	35.9	12.4	15	**2.4E+00**	no	No	(8)
7440-66-6	ZINC	15.9	6.3	23000 N	6.9E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.31 J	0.24	30 N	1.0E-02	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

FLORIDA LEVEL 1 DIRECT CONTACT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 15 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

15S00101	15S01101	15S02001-D
15S00101-AVG	15S01201	15S02101
15S00101-D	15S01301	15S02201
15S00201	15S01401	15S02301
15S00301	15S01601	15S02401
15S00401	15S01701	15S02501
15S00501	15S01701-AVG	15-SL-01
15S00601	15S01701-D	15-SL-02
15S00701	15S01801	15-SL-03
15S00801	15S01901	15-SL-04
15S00901	15S02001	15-SL-05
15S01001	15S02001-AVG	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 9-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
67-64-1	ACETONE	1/29	0.011 J	0.006	15S02101	NA (5)	100000
75-09-2	METHYLENE CHLORIDE	4/29	0.009	0.005	15S02101	NA	2400
1330-20-7	TOTAL XYLENES	3/29	0.004 J	0.004	15-SL-04	NA	140
	Semivolatile Organics (mg/kg)						
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	4/29	1.7	0.2	15S00101-D	NA	31000
85-68-7	BUTYL BENZYL PHTHALATE	1/29	0.24 J	0.2	15S00201	NA	890
84-74-2	DI-N-BUTYL PHTHALATE	6/29	1.1	0.4	15S00201	NA	110
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	1/29	0.0038	0.0038	15S01101	NA	---
72-55-9	4,4'-DDE	3/29	0.05	0.007	15S01101	NA	---
50-29-3	4,4'-DDT	2/29	0.014	0.005	15S01101	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

15S00101	15S00601	15S01201	15S01801	15S02301	15-SL-04
15S00101-D	15S00701	15S01301	15S01901	15S02401	15-SL-05
15S00201	15S00801	15S01401	15S02001	15S02501	
15S00301	15S00901	15S01601	15S02001-D	15-SL-01	
15S00401	15S01001	15S01701	15S02101	15-SL-02	
15S00501	15S01101	15S01701-D	15S02201	15-SL-03	

TABLE 9-6

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
591-78-6	2-HEXANONE	0.003 J	0.003	5.1 N	5.9E-04	NA (6)	No	maximum < SCTL
108-90-7	CHLOROBENZENE	0.002 J	0.002	30 N	6.7E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.006 J	0.006	5900 N	1.0E-06	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
106-46-7	1,4-DICHLOROBENZENE	0.11 J	0.11	6 C	1.8E-02	NA	No	maximum < SCTL
91-57-6	2-METHYLNAPHTHALENE	0.076 J	0.076	80 N	9.5E-04	NA	No	maximum < SCTL
106-44-5	4-METHYLPHENOL	0.077 J	0.077	250 N	3.1E-04	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.23 J	0.23	76 C	3.0E-03	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.041 J	0.041	54000 N	7.6E-07	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.14 J	0.14	40 N	3.5E-03	NA	No	maximum < SCTL
108-95-2	PHENOL	0.053 J	0.053	900 N	5.9E-05	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-55-9	4,4'-DDE	0.0023 J	0.0023	3.3 C	7.0E-04	NA	No	maximum < SCTL
53469-21-9	**AROCLOR-1242**	2.2	2.2	0.5 C	**4.4E+00**	NA	**Yes**	maximum > SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	15100	15100	72000 N	2.1E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	2.6	2.6	0.8 C	**3.3E+00**	no	No	(8)
7440-39-3	BARIUM	13.2 J	13.2	110 N	1.2E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.17 J	0.17	120 N	1.4E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	2.1	2.1	75 N	2.8E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	267 J	267	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	12.7	12.7	210 C	6.0E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	0.71 J	0.71	4700 N	1.5E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	6.8	6.8	110 N	6.2E-02	NE	No	maximum < SCTL
7439-89-6	IRON	9640	9640	23000 N	4.2E-01	no	No	maximum < SCTL
7439-92-1	LEAD	86.2	21.5	400	2.2E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	109 J	109	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	44.2	44.2	1600 N	2.8E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.59	0.59	3.4 N	1.7E-01	yes	No	maximum < SCTL
7440-02-0	NICKEL	3 J	3	110 N	2.7E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	157 J	157	---	---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.62 J	0.62	390 N	1.6E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	191 J	191	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	25	25	15 N	**1.7E+00**	no	No	(8)
7440-66-6	ZINC	19.1	19.1	23000 N	8.3E-04	NE	No	maximum < SCTL

TABLE 9-6

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.55 J	0.55	30	N	1.8E-02	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 15 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
15SS0201
15SS0502
15SS0603
15SS0804
15SS1005

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 9-7

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
591-78-6	2-HEXANONE	1/5	0.003 J	0.003	15SS0201	NA (5)	4200
108-90-7	CHLOROBENZENE	1/5	0.002 J	0.002	15SS0804	NA	680
1330-20-7	TOTAL XYLENES	4/5	0.006 J	0.006	15SS1005	NA	140
	Semivolatile Organics (mg/kg)						
106-46-7	1,4-DICHLOROBENZENE	1/5	0.11 J	0.11	15SS0804	NA	280
91-57-6	2-METHYLNAPHTHALENE	2/5	0.076 J	0.076	15SS0804	NA	---
106-44-5	4-METHYLPHENOL	2/5	0.077 J	0.077	15SS0603	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/5	0.23 J	0.23	15SS0603	NA	31000
84-66-2	DIETHYL PHTHALATE	1/5	0.041 J	0.041	15SS0201	NA	2000
91-20-3	NAPHTHALENE	2/5	0.14 J	0.14	15SS0603	NA	220
108-95-2	PHENOL	1/5	0.053 J	0.053	15SS0201	NA	---
	Pesticides PCBs (mg/kg)						
72-55-9	4,4'-DDE	1/5	0.0023 J	0.0023	15SS1005	NA	---
53469-21-9	AROCLOR-1242	1/5	2.2	2.2	15SS0804	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

15SS0201	15SS0804
15SS0502	15SS1005
15SS0603	

TABLE 9-8

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
591-78-6	2-HEXANONE	0.003 J	0.003	34	N	8.8E-05	NA (6)	No	maximum < SCTL
108-90-7	CHLOROBENZENE	0.002 J	0.002	200	N	1.0E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.006 J	0.006	40000	N	1.5E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
106-46-7	1,4-DICHLOROBENZENE	0.11 J	0.11	9	C	1.2E-02	NA	No	maximum < SCTL
91-57-6	2-METHYLNAPHTHALENE	0.076 J	0.076	560	N	1.4E-04	NA	No	maximum < SCTL
106-44-5	4-METHYLPHENOL	0.077 J	0.077	3000	N	2.6E-05	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.23 J	0.23	280	C	8.2E-04	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.041 J	0.041	920000	N	4.5E-08	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.14 J	0.14	270	N	5.2E-04	NA	No	maximum < SCTL
108-95-2	PHENOL	0.053 J	0.053	390000	N	1.4E-07	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-55-9	4,4'-DDE	0.0023 J	0.0023	13	C	1.8E-04	NA	No	maximum < SCTL
53469-21-9	AROCLOR-1242	2.2	2.2	2.1	C	1.0E+00	NA	No	maximum = SCTL (proposed 2004 SCTL is 2.6 mg/kg)
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	15100	15100	---	N	---	no	No	(8)
7440-38-2	ARSENIC	2.6	2.6	3.7	C	7.0E-01	no	No	(8)
7440-39-3	BARIUM	13.2 J	13.2	87000	N	1.5E-04	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.17 J	0.17	800	N	2.1E-04	NE	No	maximum < SCTL
7440-43-9	CADMIUM	2.1	2.1	1300	N	1.6E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	267 J	267	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	12.7	12.7	420	C	3.0E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	0.71 J	0.71	110000	N	6.5E-06	NE	No	maximum < SCTL
7440-50-8	COPPER	6.8	6.8	76000	N	8.9E-05	NE	No	maximum < SCTL
7439-89-6	IRON	9640	9640	480000	N	2.0E-02	no	No	maximum < SCTL
7439-92-1	LEAD	86.2	21.5	920		9.4E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	109 J	109	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	44.2	44.2	22000	N	2.0E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.59	0.59	26	N	2.3E-02	yes	No	maximum < SCTL
7440-02-0	NICKEL	3 J	3	28000	N	1.1E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	157 J	157	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.62 J	0.62	9100	N	6.8E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	191 J	191	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	25	25	7400	N	3.4E-03	no	No	maximum < SCTL
7440-66-6	ZINC	19.1	19.1	560000	N	3.4E-05	NE	No	maximum < SCTL

TABLE 9-8

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.55 J	0.55	39000 N	1.4E-05	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 15 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
15SS0201
15SS0502
15SS0603
15SS0804
15SS1005

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

10.0 SITE 16, OPEN BURNING AND DISPOSAL AREA

This section presents the results of the HHRA and SLERA conducted for surface and subsurface soil samples collected at Site 16. The assessment updates a risk evaluation presented in the 2000 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

10.1 SITE DESCRIPTION

Site 16 is approximately 12 acres in size and is located in the southwestern part of the facility, directly west of the South Air Field. At the time of the RI field investigation, Site 16 was forested with pine trees. The land surface at the northern end of the site slopes gently to the west toward Clear Creek, which is located 450 feet west of the site. Although overland transport of surface water runoff toward Clear Creek is possible, most of the on-site rainfall infiltrates directly into the ground due to erosion control measures and the porous nature of the sandy soil at Site 16. In the past, significant surface erosion was evident at several areas where no vegetation was present, and no berms were evident to control surface soil erosion.

From 1943 to 1965, this area served as the primary waste disposal area for NAS Whiting Field. Two large pits were used for the disposal of general refuse and waste from aircraft maintenance operations. Other wastes associated with aircraft maintenance and repair including paints, solvents, waste oil, hydraulic fluid, and wastewater from paint stripping operations were reportedly disposed at the site. Dielectric fluids containing PCBs may also have been disposed at the site. Annual disposal volumes are estimated to have been between 3,000 and 4,000 tons. To help reduce volumes, solid wastes were routinely incinerated using diesel fuel as an accelerant.

Recharged by storm water runoff, a small ephemeral wetland (less than 2 feet deep) is located along the eastern boundary of the site. Because much of the site was disturbed by the trench and fill operations, it is very likely this wetland is the result of land subsidence of one of the trenches. No permanent surface water bodies exist in the immediate vicinity of the site.

The approximate location of Site 16 is shown on Figure 1-2 of the 2000 RI report. Currently, ground surface at the site is slightly depressed and encircled by and bisected east to west by a raised unimproved dirt road. Vegetation consists of sparse native grasses and abundant or dense scrub oak vegetative cover in the central area. The boundary areas are predominantly covered with pine trees and dense scrub oak. There are currently no buildings at Site 16. The area is vacant, unused land at this time.

10.2 SUMMARY OF PHASE IIA/IIB AND REMOVAL ACTION FIELD INVESTIGATIONS OF SOILS

A surface soil assessment was conducted during the RI of Site 16 in two phases (Phase IIA and IIB). Phase IIA (1992) included the collection of surface soil samples from three locations (16-SL-01 through 16-SL-03) and the collection of subsurface soils from five locations. During the Phase IIB field investigation (1996), surface soil samples were collected from 17 locations (16SO01 through 16SO17). Surface soil samples were also collected from eight locations (16SO24 through 16SO26, 16SO28 and 16SO32 through 16SO35) during a 2001 field investigation associated with a removal action. (Soils associated with Phase IIB location 16SO06 were excavated during the removal action.)

The Phase IIA samples were collected at locations where surface geophysical anomalies were interpreted to be present. Because the Phase IIA surface soil sample locations were biased based on geophysical anomalies, the Phase IIB surface soil samples were collected using a random sampling technique to more appropriately support the HHRA. The Phase IIA and IIB surface soil samples were collected from a depth interval of 0 to 12 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide. The removal action soil samples referenced above were analyzed for polynuclear aromatic hydrocarbons only.

To characterize waste material within the landfill, test pits were excavated at locations where geophysical anomalies identified potential locations of buried materials. The subsurface soil dataset for Site 16 consists of one subsurface soil sample collected from each of five test pits (TP-16-02, TP-16-03, TP-16-04, TP-16-06, and TP-16-10) excavated during the 1992 Phase IIA field investigation. The Phase IIA subsurface soil samples were collected from depth intervals of 2 to 3.5 feet, 6 to 8 feet, 9 to 10 feet, 10.5 feet, and 2 feet bgs for the aforementioned test pits, respectively, and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 10-1 and 10-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Most surface and subsurface soil sample locations are presented on Figures 3-3 and 3-4 of the 2000 RI report.

10.3 HUMAN HEALTH RISK ASSESSMENT

10.3.1 Selection of COPCs for Human Health Risk Assessment

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 16. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 10-1 and 10-2, respectively.

10.3.1.1 Surface Soil

Two VOCs, 15 SVOCs, eight pesticides/PCBs, 23 inorganics, and cyanide were detected in 27 surface soil samples collected at Site 16. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 10-1. Also presented in Table 10-1 are the results of the site-specific data-to-background data comparisons conducted as described in Appendix A. The maximum concentrations of the following chemicals in surface soil exceeded direct contact, risk based COPC screening levels, and the chemicals were retained as COPCs for surface soil at Site 16:

- cPAHs
- Pesticides/PCBs (Aroclor-1254, Aroclor-1260, and dieldrin)
- Inorganics (antimony, barium, cadmium, chromium, copper, lead, and mercury)

Concentrations of cPAHs exceeded the simple apportioned and non-apportioned PRGs and SCTLs. Concentrations of Aroclor-1254, Aroclor-1260, and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Concentrations of dieldrin exceeded the simple apportioned and non-apportioned PRGs and simple apportioned SCTL but were less than the non-apportioned SCTL. Concentrations of antimony exceeded the simple apportioned PRG but were less than the non-apportioned PRG and apportioned and non-apportioned SCTLs. Concentrations of barium and copper exceeded the simple apportioned and non-apportioned SCTLs but were less than the apportioned and non-apportioned PRG. The maximum concentration of mercury exceeded the simple apportioned SCTL only.

Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria (Table 10-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Also, surface soils associated with NAS Whiting Field disposal areas are composed of natural soil covers and do not reflect subsurface landfill contents. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 16. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 16 surface soils.

10.3.1.2 Subsurface Soil

Seven VOCs, 11 SVOCs, four pesticides, 21 inorganics, and cyanide were detected in the five subsurface soil samples collected at Site 16. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 10-2. Also presented in Table 10-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in subsurface soil at maximum concentrations exceeding the direct contact, risk based COPC screening levels and were retained as COPCs for subsurface soil at Site 16:

- cPAHs
- Inorganics (barium, cadmium, chromium, copper, and lead)

Concentrations of cPAHs and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Concentrations of barium exceeded the simple apportioned and non-apportioned SCTLs but were less than the simple apportioned and non-apportioned PRGs. Concentrations of cadmium exceeded the simple apportioned PRG but were less than the non-apportioned PRG and simple apportioned and non-apportioned SCTLs. Concentrations of copper exceeded the apportioned and non-apportioned PRGs and SCTLs. The maximum concentration of lead exceeded all COPC screening levels presented in Table 10-2.

Although concentrations of aluminum, arsenic, iron, manganese and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 16. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 16 subsurface soils.

Antimony was not selected as a COPC based on the site data-to-background data comparisons presented in Appendix A.

10.3.2 Risk Characterization

This section provides a characterization of potential human health risks associated with potential exposures to chemicals in surface and subsurface soils at Site 16. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user/trespasser) using USEPA and proposed FDEP risk assessment guidance. The results of the risk characterization are discussed below.

10.3.2.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 16 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 10.3. Potential cancer risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 10-3. The results are discussed below. Chemical-specific risks for Site 16 are presented in Appendix B.

Non-carcinogenic Risk

Cumulative HIs for exposures to surface and subsurface soil for all receptors were less than or equal to 1, indicating adverse, non-carcinogenic effects are not anticipated under the conditions defined in the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to surface and subsurface soil were less than or within USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for all receptors. However, ILCRs calculated for the resident hypothetically exposed to surface soils and the construction worker exposed to subsurface soils exceeded the State of Florida's target risk level of 1×10^{-6}. For most receptors, the primary contributors to the cancer risk estimates for surface soils were cPAHs. The chemical-specific ILCR for chromium exceeded 1×10^{-6} for exposures to subsurface soil by construction workers.

Risks from Lead

Lead was identified as a COPC in surface soil and subsurface soil at Site 16. The maximum detected concentration of 759 mg/kg in surface soil and 766 mg/kg in subsurface soil exceeded the USEPA screening level of 400 mg/kg for residential exposures.

Hypothetical future residential exposures to lead in surface soil and subsurface soil were evaluated using the IEUBK lead model (USEPA, May 2002). As recommended by the IEUBK model, the average concentrations of lead in surface soil (103 mg/kg) and subsurface soil (286 mg/kg) were used as the EPCs. Default values were used for the rest of the model input parameters. IEUBK model outputs are included in Appendix B. The lead concentration of 103 mg/kg in surface soil results in less than 1 percent of future on-site child residents having a blood lead level greater than 10 µg/dL and results in a geometric mean blood lead level of 2.5 µg/dL. The lead concentration of 286 mg/kg in subsurface soil results in 3 percent of future on-site child residents having a blood lead level greater than 10 µg/dL and results in a geometric mean blood lead level of 4.2 µg/dL. These values do not exceed the USEPA goal as described in the 1994 OSWER Directive of no more than 5 percent of children exceeding a 10 µg/dL blood lead level.

Exposures to lead in surface soil by construction workers and occupational workers were evaluated using a slope factor approach developed by the USEPA TRW for Lead (USEPA, 2003). As recommended by the model, the average lead concentrations in surface soil (103 mg/kg) and in subsurface soil (286 mg/kg) were used as the EPCs. Although ILCRs and HIs are typically calculated using RME assumptions, the adult lead model guidance documents recommend the use of CTE assumptions in evaluating adult exposures to lead in soil (USEPA, 2003). Therefore, the incidental ingestion rate was assumed to be 200 mg per day for the construction worker and 50 mg per day for the occupational worker (USEPA, 2004), and the exposure frequency was assumed to be 219 days per year (USEPA, 2004). Values of 2.07 and 1.39 µg/dL were used for the standard deviation and baseline blood lead concentration, respectively, which are the recommended values for Florida (FDEP, 2004). Default values were used for the remaining model input parameters. Results of the model runs are included in Appendix B. The fetus of a pregnant worker is the receptor of concern for the TRW model. For construction workers exposed to surface soil, the lead concentration of 103 mg/kg results in 0.9 percent of the receptors (fetuses) having a blood lead level greater than 10 µg/dL and results in a geometric mean blood lead level of 2.0 µg/dL. For occupational workers exposed to surface soil, the lead concentration of 103 mg/kg results in 0.3 percent of receptors (fetuses) having a blood lead level greater than 10 µg/dL and results in a geometric mean blood lead level of 1.5 µg/dL. For construction workers exposed to subsurface soil, the lead concentration of 286 mg/kg results in 3.7 percent of receptors having a blood lead level greater than 10 µg/dL and a geometric mean blood lead level of 3.0 µg/dL. For occupational workers exposed to subsurface soil, the lead concentration of 286 mg/kg results in 0.6 percent of receptors having a blood lead level greater than 10 µg/dL and a geometric mean blood lead level of 1.8 µg/dL. These values do not exceed the USEPA goal of no more than 5 percent of children (fetuses of exposed women) exceeding a 10 µg/dL blood lead level.

10.3.2.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 16 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 10-4 through 10-9 and are discussed below.

10.3.2.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 10-4 presents a comparison of the maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs. The following chemicals were identified as exceeding the Level 1 SCTLs and were retained as potential COCs for residential exposures to surface soil at Site 16:

- cPAHs (evaluated as benzo(a)pyrene equivalents)
- Inorganics (barium, lead, and copper)

The maximum detected barium and copper concentrations exceeded acute SCTLs at location 16S007 only.

The maximum detected concentrations and EPCs for arsenic, iron, and vanadium also exceeded the Level 1 criteria. In addition, the maximum detected concentration of arsenic exceeded three times the residential SCTL. However, please see preceding discussions regarding these metals (Section 10.3.1). Arsenic, iron, and vanadium were not retained as potential COCs for residential exposures to surface soil at the Site 16.

As shown in Table 10-5, the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified four potential COCs; therefore, a Level 2 evaluation was conducted. A comparison of maximum detected concentrations and EPCs for surface soil to FDEP industrial SCTLs is presented in Table 10-6. The maximum detected concentration for the cPAHs

(0.51 mg/kg) ***marginally*** exceeded the SCTL (0.5 mg/kg) but is less than the proposed 2004 SCTL (0.7 mg/kg). (The EPC is also less than the current or proposed SCTLs.) Therefore, cPAHs were not selected as potential COCs for the industrial land use scenario. The EPC for arsenic also exceeded the Level 2 criteria. In addition, the maximum detected concentration of arsenic exceeded three times the non-apportioned industrial SCTL. However, please see the preceding discussions regarding arsenic (Section 10.3.1). No chemicals were retained as COCs for industrial exposures to surface soil at the Site 16.

Level 3 Evaluation (Recreational)

No COCs were identified in the Level 2 evaluation; consequently, a Level 3 evaluation was not required.

10.3.2.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 10-7 presents a comparison of the maximum detected concentrations and EPCs for chemicals in subsurface soil to the FDEP residential SCTLs. Maximum concentrations of the following chemicals exceeded the Level 1 SCTLs and were retained as potential COCs for residential exposures to subsurface soil at Site 16:

- Inorganics (barium, copper, and lead)

The maximum detected copper concentration was also greater than three times the residential SCTL.

The maximum concentrations of arsenic, iron, and vanadium also exceeded the Level 1 criteria. In addition, the maximum detected concentrations of arsenic, iron, and vanadium exceeded three times the residential SCTL. However, please see the preceding discussions regarding these metals (Section 10.3.1). These inorganics were not retained as potential COCs for residential exposures to subsurface soil at the Site 16.

As shown in Table 10-8, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified three potential COCs; therefore, a Level 2 evaluation was conducted. A comparison of the maximum detected concentrations and EPCs for chemicals detected in subsurface soil to FDEP industrial SCTLs is presented in Table 10-9. The EPC for arsenic exceeded the

Level 2 criteria. In addition, the maximum detected concentration of arsenic exceeded three times the industrial SCTL. However, please see the preceding discussions regarding arsenic (Section 10.3.1). No chemicals were retained as potential COCs for industrial exposures to subsurface soil at the Site 16.

Level 3 Evaluation (Recreational)

No COCs were identified in the Level 2 evaluation; consequently, a Level 3 evaluation was not required.

10.3.3 Site-Specific Uncertainty Analysis

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the interpretation of the final risk estimates, is provided in this section.

10.3.3.1 Uncertainty Associated with a Construction Worker Exposed to Chromium in Subsurface Soil

The ILCR for exposure by construction workers to chromium in subsurface soil was 2×10^{-6}, which exceeds the State of Florida's target risk level of 1×10^{-6}. The risk estimates were based on a construction worker being exposed to fugitive dust emissions generated by vehicular traffic during a construction project assumed to last for 1 year. Although a construction project lasting 1 year is possible at Site 16, it is very unlikely a construction worker would be exposed to high levels of fugitive dusts from subsurface soil for the entire duration of the construction project. Consequently, there is uncertainty associated the evaluation of construction workers exposed to fugitive dusts from subsurface soil. It is likely this uncertainty results in an overestimation of risk.

10.3.3.2 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 16 were selected using available background concentrations for soil. Aluminum, arsenic, iron, manganese, and vanadium in surface soil and aluminum, antimony, arsenic, iron, and vanadium in subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	18,600	29,000	72,000
Antimony	Not Applicable	6.7	26
Arsenic	12.1	15.1	0.8

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Iron	48,900	74,800	23,000
Manganese	372	638	1,600
Vanadium	28.9	67.5	15

The SCTLs presented for aluminum, antimony, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-fourth of the SCTL, and the maximum detected concentration in subsurface soil is approximately two-fifths of the SCTL. The maximum detected concentration of iron in surface soil is approximately twice the SCTL, and the maximum detected concentration is subsurface soil is approximately three times the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse, non-cancer health effects. The maximum detected concentration of antimony in subsurface soil is approximately one-fourth of the SCTL. The maximum detected concentration of manganese in surface soil is approximately one-fourth of the SCTL, and the maximum detected concentration of manganese in subsurface soil is approximately two-fifths of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 1.9 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 4.5 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the “pica” soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1×10^{-6} and 1×10^{-5} cancer risk levels but not the 1×10^{-4} risk levels.

10.3.3.3 Limited Subsurface Soil Dataset

Five subsurface soil samples only were collected for chemical analysis during the field investigation at Site 16. However, the subsurface soil samples were collected from test pits excavated at locations where geophysical anomalies identified potential locations of buried materials.

10.3.4 Summary and Conclusions

An HHRA was conducted for the chemical concentrations detected in 27 surface soil and five subsurface soil samples collected at Site 16. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 16. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

Four organics (cPAHs, Aroclor-1254, Aroclor-1260, and dieldrin) and seven inorganics (antimony, barium, cadmium, chromium, copper, lead, and mercury) were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. The cPAHs, barium, cadmium, chromium, copper, and lead were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) did not exceed 1 for any of the receptors evaluated for exposure to surface or subsurface soils. Consequently, adverse, non-carcinogenic health affects are not anticipated under the conditions defined for the exposure assessment. Although the cancer risk estimate developed for the COPCs for surface soil for one of the five receptors evaluated (hypothetical future resident) exceeded the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the cPAHs; chemical-specific risk estimates for all other COPCs are less than 2×10^{-7}. The cancer risk estimate for a construction worker exposed to subsurface soils is 2×10^{-6} (primarily due to chromium); risk estimates for the resident and typical industrial worker exposed to subsurface soils are less than 1×10^{-6}. The risk evaluation of lead concentrations detected in the Site 16 soils indicates exposure to the average lead concentration in the soils would not result in blood lead concentrations exceeding USEPA benchmarks.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of maximum detected concentrations to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	None	None
Barium		
Copper		
Lead		

The quantitative risk assessment summarized in the preceding paragraph indicates cancer and non-cancer risk estimates for all other chemicals listed above do not exceed USEPA or State of Florida risk benchmarks (i.e., a cancer risk level of 1×10^{-6} or an HI of 1). The maximum concentrations of barium (257 mg/kg) and copper (202 mg/kg) exceed acute SCTLs. However, only the barium and copper results reported for location 16S007 exceed the acute SCTLs. The cPAH concentrations reported for this location also exceed non-apportioned SCTLs.

The following chemicals were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations to SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Barium	None	None
Copper		
Lead		

Maximum barium and copper concentrations in the subsurface soils exceed acute SCTLs. The maximum, but not the average, lead concentrations in the subsurface soils exceed the SCTL.

10.4 ECOLOGICAL RISK ASSESSMENT

This section presents the results of the ecological risk assessment conducted for surface soil samples collected at Site 16 previously described in Section 10.1. The assessment updates a risk evaluation presented in the 2000 RI report prepared for the U.S. Navy by Harding Lawson Associates. (A copy of the original risk assessment for Site 16 is provided in Appendix C.) This risk assessment was conducted based on current USEPA methodology as detailed in Ecological Risk Assessment for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997). Additional guidance included the Eco Update: The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (USEPA, 2001).

The objective of this ecological risk assessment is to re-evaluate and update the previous ecological risk evaluation for Site 16 to assure compliance with current Navy, USEPA, and State of Florida guidance/methods and, to update any risk assessment results potentially impacting risk management decisions for this site.

10.4.1 Initial Screening Evaluation

10.4.1.1 Data for Assessment

As discussed in Section 10.3, 49 chemicals were detected in Site 16 surface soils. Table 10-10 illustrates the descriptive statistics for the target analytes detected in the samples. The chemicals evaluated in this assessment include two VOCs, 15 SVOCs including 13 polynuclear aromatic hydrocarbons (PAHs), eight pesticides/PCBs, 23 inorganics, and one miscellaneous compound (cyanide).

10.4.1.2 Screening Level Ecological Effects Evaluation

The screening-level effects evaluation establishes constituent exposure levels representing conservative thresholds for adverse ecological effects. The toxicity screening values used in this screening are threshold concentrations below which effects are rare and above which effects are more likely. The screening values are set conservatively to minimize the potential for disregarding potentially significant effects and are used to conduct an initial direct toxicity screening of chemicals concentrations detected in the surface soils.

USEPA Region 4 has published direct toxicity screening values for surface soil based on a literature review by the Westinghouse Savannah River Company, Savannah River Technology Center (Friday, 1998). USEPA Region 4 screening values are not available for the nutrients calcium, magnesium, potassium, and sodium. These metals are not considered candidates for inclusion as COPCs and are not carried forth in the analysis. They are essential nutrients, are well tolerated, and not toxic except at extremely elevated levels. The screening levels for this assessment are listed in Table 10-10.

In the direct toxicity screening, ecological risk is characterized by comparing maximum concentrations detected in surface soil (Table 10-10) to the USEPA Region 4 screening levels. Chemicals with no screening levels are carried forward in the risk assessment as COPCs. Results are interpreted through the use of the “quotient method”. Hazard quotients (HQs) for direct toxicity screening are calculated by dividing the maximum environmental concentration for each constituent by the corresponding screening value. An HQ less than 1.0 indicates risk is unlikely and no further investigation of the chemical for a particular exposure pathway/medium is warranted.

The results of the direct-toxicity screening for surface soil using maximum concentrations and USEPA Region 4 screening values are illustrated in Table 10-10. Three PAHs (benzo(a)pyrene, fluoranthene, and pyrene), and total PAH are retained as COPCs because their maximum HQ is greater than or equal to 1.0. Four pesticides (4,4’-DDD, 4,4’-DDE, 4,4’-DDT, and dieldrin), as well as total DDT (DDTR) are retained as COPCs as their respective HQs were greater than or equal to 1.0. The two PCBs (aroclor-1254 and aroclor-1260) as well as total PCBs had HQs greater than or equal to 1.0 and are retained as COPCs. Fourteen metals (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, silver, vanadium, and zinc) are retained as COPCs.

The following constituents are retained as COPCs in the absence of USEPA Region 4 screening values: nine PAHs including 1-methylnaphthalene, acenaphthylene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and ideno(1,2,3-cd)pyrene; one SVOC bis(2-ethylhexyl)phthalate and the pesticides alpha-chlordane and gamma-chlordane.

10.4.1.3 Screening Level Food Chain Modeling

In accordance with USEPA Region 4 guidance, bioaccumulative compounds identified as COPCs in the direct toxicity screening level risk calculation (i.e., Table 10-10) were further analyzed in food chain modeling. The USEPA (2000) has published a list of important bioaccumulative compounds. The COPCs on this list are included in the food-chain modeling while those not listed are not. Although several PAHs are included in the list of bioaccumulative compounds, USEPA Region 4 typically does not require the inclusion of PAHs in food-chain models unless present in percent concentrations (i.e., exceedingly elevated). Six pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT [and DDTR], dieldrin, alpha-chlordane, and gamma-chlordane), two PCBs (aroclor-1254 and aroclor-1260 [and total PCBs] and eight metals (arsenic, cadmium, chromium, copper, lead, mercury, silver and zinc) were evaluated in the food chain model (FCM).

A review of the 2000 RI for Site 16 (Appendix C) indicated the Conceptual Site Model (CSM) and the assessment and measurement endpoints presented in the 2000 RI are applicable to the site's present status. The guilds selected for food chain modeling in this re-evaluation were based on those modeled in the previous 2000 RI, however, the receptors selected for food chain modeling have been modified from those previously evaluated. The receptors for food chain modeling were selected based on the species identified in Tables 4-1 and 4-2 of the Initial Assessment Study of NAS Whiting Field (Envirodyne, 1985). Modeled receptors included: cotton mouse (mammalian herbivore), short-tailed shrew (mammalian insectivore), bobwhite (avian herbivore), robin (avian insectivore), hawk (avian carnivore), and the gray fox (mammalian carnivore). The only species used in food chain modeling not identified within the Initial Assessment Study is the robin. The robin was selected for inclusion as an insectivore because its body weight to ingestion rate ratio provides a conservative surrogate for risk assessment, and because of its common occurrence in the environment over a broad geographical span. Input for the screening level FCM included maximum concentrations of the bioaccumulative COPCs, and conservative exposure parameters from USEPA's Wildlife Exposure Factors Handbook (USEPA, 1993). Tables detailing the derivation of exposure factors are included in Appendix C.

Ecotoxicity screening values used in the FCM were based on no observed adverse effect levels (NOAELs) from the literature. The use of NOAELs is appropriate for screening level assessments to ensure risk is not underestimated. Selection of NOAELs from the literature was based on the species tested, the route of exposure, the duration of the study, and the measured effect. Priority was given to studies evaluating ecological effects impacting populations, including adverse effects on development, reproduction, and survival. The toxicity reference values used for each modeled receptor are listed in Appendix C. In the FCM, HQs were calculated by dividing each modeled dose by the corresponding NOAEL. Copies of FCM calculations are included in Appendix C. Table 10-11 illustrates the results of the screening level food chain analysis.

The results of the screening level FCM indicated potential risks to the cotton mouse from arsenic, lead, and mercury, to the short-tailed shrew from dieldrin, aroclor-1254, aroclor-1260, total PCB, arsenic, cadmium, copper, lead, mercury, and zinc, to the bobwhite from lead, mercury, and zinc, to the robin from DDE, DDT, DDTR, dieldrin, aroclor-1254, aroclor-1260 total PCB, arsenic, cadmium, chromium, copper, lead, mercury, and zinc, to the hawk from lead and zinc, and to the fox from aroclor-1254, aroclor-1260 and total PCB. Incidental ingestion of soil and consumption of soil invertebrates appears to contribute the most to potential risks.

10.4.2 <u>Refinement of COPCs</u>

The objective of the refinement step is to better define those constituents potentially contributing unacceptable levels of ecological risk, and to identify and eliminate from further consideration those COPCs initially retained because of the use of very conservative exposure scenarios or screening levels. The refinement includes consideration of site-specific parameters such as spatial distribution and frequency of detection of chemicals, receptor home range, constituent bioavailability, and background in defining those COPCs associated with the highest potential risk at the site. Additionally, soil guidelines other than the USEPA Region 4 soil screening levels are compared to site COPC concentrations to reduce the uncertainty associated with using very conservative screening values and the consequential overestimates of potential risk, and to assist in characterizing spatial distribution of potential risk. Using less conservative assumptions, screening level risk estimates are re-calculated for those constituents identified as COPCs in the screening-level analysis and these new estimates used to refine the list of COPCs.

10.4.2.1 Refinement Direct Toxicity Calculation

The direct toxicity screen was recalculated for the COPCs identified in the screening level analysis using arithmetic mean site concentrations. The results of the analysis as illustrated in Table 10-12 show HQs were much lower than those calculated in the initial screening analysis. For example, arsenic, barium, cadmium, copper, and silver, had HQs less than 1.0 when mean concentrations were used. However, HQs calculated for several chemicals still exceed one. This may indicate several COPC concentrations above the USEPA Region 4 screening levels across the site and/or potential hot spot contribution to elevated concentrations.

10.4.2.2 Refinement Food Chain Model

Refinement food chain modeling was performed for those bioaccumulative constituents identified as food chain COPCs in the initial screening level food chain model. Mean COPC concentrations and average exposure parameters were used in the refinement FCM. In contrast to the use of exposure parameters that maximized the modeled dose to receptors in the screening level FCM, average exposure parameters (i.e. ingestion rates, body weight) are applied to the same model in the refinement step. Average exposure parameters used in the Refinement FCM were derived from data in the Wildlife Exposure Factors Handbook (USEPA, 1993) as shown in Appendix C.

In the initial screening level assessment, a Site Use Factor (SUF) of 1.0 was used indicating the receptor spent 100% of its time at the site (i.e., in the area of maximum contaminant concentration). However, actual exposure will be a function of the home range of the receptor (how large an area the receptor normally covers in its day-to-day activities related to feeding) and the areal extent of contamination. Consequently, in the refinement FCM, SUFs were calculated by dividing the site area by the mean home range of the receptor. Conservatively, a minimum SUF value of 0.1 was used even though several receptors demonstrated much lower SUFs. For those receptors whose home range is less than the area of the site, the SUFs remain equal to one. The SUF was incorporated into the FCM dose calculations to account for differences between site size and receptor home range.

In the refined FCM, estimated doses were compared to NOAEL as well as lowest observed adverse effect levels (LOAELs) to provide a range of risk. NOAEL-based HQs were calculated to estimate the upper bound (more conservative) risk estimate and LOAEL-based HQs were calculated to estimate the lower bound (less conservative) risk estimate. Copies of the refinement FCM calculations are included in Appendix C.

The results of the refinement food chain modeling are illustrated in Table 10-13. The refinement FCM for Site 16 indicated NOAEL-level risk for the shrew from arsenic and lead. The robin had NOAEL-level risk from the metals cadmium, chromium, lead, mercury, and zinc. LOAEL-level risk was seen only for the robin for exposure to lead. While potential risks are estimated at the NOAEL-level of toxicity, potential risk is not anticipated at the less conservative LOAEL-level of toxicity except for lead in the robin.

10.4.2.3 Spatial Distribution

To assess the spatial extent of potential ecological risk, COPC concentrations at all sampling locations were compared to USEPA Region 4 screening values. For COPCs lacking USEPA Region 4 screening values, conclusions regarding spatial extent of potential risk could not be made. Table 10-14 illustrates the COPCs and the number of locations where concentrations exceeded the applicable USEPA Region 4 screening value. All of the samples analyzed for aluminum, chromium, iron and vanadium (19 of 19) had concentrations in excess of their respective USEPA Region 4 screening levels. The range of HQs were: aluminum (HQs of 40 to 372), chromium (HQs of 8 to 73), iron (HQs of 7.4 to 244.5), and vanadium (HQs of 1.7 to 14.1).

For PAHs, benzo(a)pyrene exceeded its screening level in 4 of 19 samples (HQs of 1.2 to 3.1), fluoranthene in 2 of 19 samples (HQs of 1.7 to 2.6), and pyrene in 2 of 19 samples (HQs of 1.5 to 1.7). In samples analyzed for pesticides, 1 of 19 had 4,4'-DDD (HQ of 7.2), 8 of 19 had 4,4'-DDE (HQs of 1.3 to 21.2), 8 of 19 had 4,4'-DDT (HQs of 1.5 to 8.8), 8 of 19 had DDTR (HQs of 2.8 to 32.4), and 7 of 19 had dieldrin (HQs of 5 to 66) concentrations above their respective USEPA Region 4 screening values. Aroclor-1254 exceeded its screening level in 2 of 19 samples (HQs of 1.8 to 6.5), aroclor-1260 in 1 of 19 (HQ of 5.5), and total PCBs in 3 of 19 samples (HQs of 1.8 to 6.5). Manganese exceeded its screening level in 9 of 19 samples (HQs of 1.2 to 3.7), lead in 8 of 19 samples (HQs of 1.2 to 15.2), zinc in 6 of 19 samples (HQs of 1.2 to 15.5), copper in 4 of 19 samples (HQs of 1.3 to 5), mercury in 4 of 19 samples (HQs of 1.1 to 6.5), cadmium in 3 of 19 samples (HQs of 1.3 to 4.8), and silver in 3 of 19 samples (HQs of 1.1 to 3.6). Antimony, arsenic, and barium each exceeded their respective USEPA Region 4 screening levels in only one location, indicating potential risks from these chemicals may be localized.

For those COPCs where all samples had concentrations in excess of their respective USEPA Region 4 screening levels (aluminum, chromium, iron and vanadium), this may correspond to a large portion of the 12-acre site having potential risk to soil invertebrates and plants. For the remaining COPCs, the highest areas of potential risk may be divided between the northern and southern portions of the site based on the numbers of samples exceeding their respective guidelines in each area. For metals, the southern portion of the site appears to represent the largest area of potential risk. Several metals such as lead, manganese, and zinc had samples exceeding their guidelines in both portions of the site however, concentrations for lead and zinc were higher in the southern part of the site while manganese had similar concentrations across the site. The highest levels of potential risk from PAHs appears to be on the southern part of the site. The majority of sample locations with risk from 4,4'-DDD, DDE, and DDT were located in the southern part of the site. The highest concentrations of 4,4'-DDD, DDE, and DDT were also located in the southern part of the site. Dieldrin had more sample locations exceeding its screening level in the northern portion of the site with similar concentrations between northern and southern sample locations. Alpha- and gamma-chlordane were detected at two locations in the northern portion of the site and at one location in the southern portion of the site. No USEPA Region 4 screening levels are available for these compounds so potential risk was not estimated. The concentration of alpha-and gamma-chlordane was highest in the southern portion of the site and so presumably is any potential risk. PCBs were found at two northern and one southern sample locations with the highest concentrations in the northern part of the site; consequently, the area of potential risk from PCB is greatest in the northern portion of the site. Overall, the southern portion of Site 16 appears to have the largest affected areas for potential risk as well as the highest COPC concentrations.

As part of the evaluation of spatial distribution, an analysis of the locations of maximum detected concentrations was also performed to identify potential hot spots at Site 16. The results of this analysis indicated a potential hotspot is present at sample location 16S007 where 21 of the 35 COPCs retained following the screening level analysis had their maximum concentrations. To ascertain the potential impacts of sample location 16S007 upon direct toxicity and food chain risks, the direct toxicity and food chain analyses were re-run without this sample location's data included in the analysis. The results as illustrated in Tables 10-15 and 10-16 indicated a decrease in the HQs for direct toxicity with 4,4'-DDD, antimony, and barium having HQs less than 1.0, and a reduction in food chain risk with the shrew having NOAEL-level risk for arsenic, and the robin having NOAEL-level risk for chromium, lead, mercury, and zinc. Based on this analysis, it appears sample location 16S007 is a hotspot and contributes a high level to the overall site risk. Removing sample location 16S007 from the analysis resulted in 11 of the 35 COPCs retained following the screening level analysis having their maximum concentrations at sample location 16S011. This may indicate the presence of another hotspot or the continuation of the hotspot at 16S007. The actual extent of contamination in the vicinity of these two locations is unknown.

10.4.2.4 Frequency of Detection and Detection Limits

The COPCs 1-methylnaphthalene, acenapthalene, dibenzo(a,h)anthracene, naphthalene, aroclor-1260, and antimony were each detected in only one sample location. The potential ecological risk associated with these COPCs is therefore localized and not site-wide. The COPC arsenic, while detected in 19-of-19 samples, had only one sample with a concentration greater than its USEPA Region 4 screening level (sample 16S011). Potential risk from arsenic is also localized and does not appear to be a site-wide concern. The PAHs flouranthene and pyrene were each detected in 9 of 27 samples but exceeded their respective screening levels in only two samples each. The reported maximum concentration for bis(2-ethylhexyl)phthalate (110 μg/Kg) was less than the lowest reported non-detected concentration of 350 μg/Kg suggesting the chemical might be attributable to laboratory contamination. Phthalates are common laboratory contaminants; hence low detections in environmental samples might not reflect site contamination.

10.4.2.5 Bioavailability

To assess the potential bioavailability of Site 16 COPCs, total organic carbon (TOC) and pH data for site surface soil was researched. No TOC data was found in the analytical data in Appendix C of the Site 16 2000 RI. In the absence of TOC data, potential effects on bioavailability from adsorption to organic carbon could not be assessed.

Data on surface soil pH was found in the document: Toxicity Analysis of Soil Samples From NAS Whiting Field Milton, Florida (ESE, 1996). The average pH was 5.93 in Site 16 surface soils submitted for toxicity testing. Based on the measured soil pH, aluminum and iron are not anticipated to be toxic to plants or invertebrates. According to the Ecological Soil Screening Level (Eco-SSL) developed by the USEPA for aluminum (USEPA, 2003), aluminum is only identified as a COPC at sites where the soil pH is less than 5.5. The Eco-SSL for iron states iron is not expected to be toxic in soils with a pH between 5 and 8 (USEPA, 2003). Also, the evaluation of total metal concentrations does not accurately reflect the biologically available fraction (NFESC, 2000). Metals in soils may become less bioavailable over time, which is consistent with natural attenuation mechanisms. Studies have shown metals originally sorbed to the soil surface can migrate to internal sites within the soil structure resulting in metals being less chemically labile and thus less bioavailable. Consequently, the bioavailability of metals in the environment is typically less than found in experimentally administered media.

The amount of metal desorbed from food or from incidentally ingested soils is dependent on numerous factors such as pH and chemical form (soluble-insoluble). Arsenic in soil has been shown to be 10 to 50% as bioavailable as soluble arsenic; cadmium in soil may have a relative bioavailability of 33%; trivalent chromium and hexavalent chromium have demonstrated 1% and 10% bioavailability respectively. Animal studies with lead support a default assumption of 30% adsorption from soil. Soluble forms of inorganic mercury appear to be 15 to 25% adsorbed; bioavailability of mercury in soil was estimated to be less than 10%, while elemental mercury demonstrated an oral absorption of 0.01 to 0.1%. Less than 5% of the most soluble nickel salts are orally absorbed (NFESC, 2000).

In general, the chlorinated pesticides are very persistent and remain bioavailable to soil invertebrates and plants (Verma and Pillai 1991). (Plants may absorb pesticides from soil, but they are poorly translocated and remain primarily in the roots.) In the absence of site-specific data to indicate otherwise, pesticides are presumed to be bioavailable to plants and invertebrates, and to vertebrate receptors.

The persistence of PCBs increases with an increase in the degree of chlorination (USEPA, 1988). Higher chlorinated biphenyls are more resistant to biodegradation, and degradation may occur very slowly. The bioavailability of PCBs decreases with time spent in the environment (HSDB, 2002). PCBs adsorb strongly to soil particles, with adsorption generally increasing with the degree of chlorination of the PCB. PCBs will generally not leach significantly in aqueous soil systems. Lower chlorinated PCBs volatilize more readily from soil surfaces. Higher TOCs of soils tend to decrease the bioavailability of PCBs. In the absence of site-specific TOC information, PCBs are anticipated to remain bioavailable and adsorbed to soil particles in site soils with potential exposure primarily through direct exposure and diet.

VOCs detected in soils are anticipated to be biodegraded or volatilize to the atmosphere and not be available for exposure of potential ecological receptors. Phthalates adhere strongly to organic matter in soil. However, due to their limited mobility in soil, the overall implication is that phthalates are not highly available.

PAHs have been demonstrated to have a declining bioavailability in soil over time due in part to the sequestration of PAHs in the soil. Laboratory studies have shown sequestration results in a reduction in bioavailability in test animals (Kelsey and Alexander, 1997). The average of six month and one year bioavailability of benzo(a)pyrene in sandy soil has been shown to be 58.3%, and in clay-based soil to be 38.6% (Goon et al., 1991). PAHs are generally not appreciably water-soluble and tend to adhere to particulate matter in soil. PAHs may be absorbed by plants, but they are anticipated to be translocated, metabolized, and potentially photodegraded within the plant. Accumulation within plants is anticipated to occur only in heavily polluted locations where uptake rates could exceed the rate of metabolism and degradation (Edwards, 1983). Due to the physical characteristics of PAHs and low soil-to-plant uptake, the overall implication is PAHs are not highly available except possibly to invertebrates consuming soil and the upper-trophic level organisms consuming them.

10.4.2.6 Comparison to Background

To distinguish between the potential ecological risk associated with Site 16 surface soils and the risk contributed by background concentrations of COPCs, a comparison between site concentrations and background concentrations was performed. Appendix A contains details on the background comparison methodology and results for Site 16. Table 10-17 summarizes the results of the comparison for Site 16. As can be seen, no background data was available for PAHs, pesticides, and PCBs so they remain as COPCs for Site 16. For metals, aluminum, manganese, silver, and vanadium had site concentrations less than background. Concentrations of chromium at Site 16 were only slightly elevated above background. The individual metal constituents aluminum, iron, manganese, and vanadium have no direct evidence of site-related use at Site 16 and the process and procedures at this site did not likely contribute to the presence of these inorganic analytes in surface or subsurface soil. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field,” presenting the technical basis for this determination. Considering the information presented above, aluminum, iron, manganese, and vanadium are not considered constituents of potential concern (COPCs) for Site 16 surface and subsurface soils. Also, based on additional review of inorganic data from the facility and surrounding area in April 2001, the observed arsenic values were determined to represent naturally occurring levels [Florida Department of Environmental Protection (FDEP), 2001]. Because the identified risks associated with arsenic are now considered to be due to naturally occurring levels, arsenic will not be retained as a COC.

10.4.2.7 Comparison to Various Surface Soil Guidelines

For those COPCs with site concentrations greater than background, a comparison was performed with various soil guidelines to assist in the identification of COPCs contributing the greatest potential ecological risk at Site 16. Ecological soil guidelines were obtained from the same source document from which the USEPA Region 4 screening values were developed (Friday, 1998). The soil guidelines used in the comparison included United States Fish and Wildlife Service [USFWS (Beyer 1990)], Oak Ridge National Laboratory [ORNL (Efroymson et al. 1997a,b)], the Dutch (MVROM, 2000), and Canadian (CCME 1997 updated 1999) values. The Dutch and Canadian values have been updated since 1998 so values from the original source document (Friday, 1998) were also updated as appropriate.

The USFWS (Beyer, 1990) values include two categories. Category A refers to background concentrations in soil or detection limits, and category B refers to moderate soil contamination requiring additional study. ORNL identified soil values specific to Department of Energy sites for the protection of soil invertebrates, microbial processes, and terrestrial plants. The Canadian Council of Ministers of the Environment (CCME) guidelines were derived specifically for the protection of ecological receptors in the environment or for the protection of human health associated with agricultural, residential/parkland, commercial, and industrial land use types. The Dutch target values indicate the soil quality required for sustainability or, expressed in terms of remedial policy, the soil quality required for the full restoration of the soil’s functionality for human, animal, and plant life. The Dutch intervention values, indicate the concentration levels of the contaminants in the soil above which the functionality of the soil for human, plant, and animal life is seriously impaired or threatened.

Table 10-18 illustrates maximum and mean COPC concentrations and the above-referenced soil guidelines.

A limited number of guidelines are available for SVOCs. For PAHs, benzo(a)pyrene exceeded the lowest guideline (Beyer A) in 3 of 27 samples but did not exceed the Beyer B or CCME values. Fluoranthene and pyrene exceeded the lowest guideline (Beyer A) in 2 of 27 samples but did not exceed the Beyer B value. Total PAH exceeded the lowest guideline (Beyer A, Dutch Target) in 2 of 27 samples but did not exceed the Beyer B, or Dutch Intervention values. Bis(2-ethylhexyl)phthalate exceeded the lowest total guideline for total phthalate (Dutch Target) at just one location. This indicates the potential ecological risk from bis(2-ethylhexyl)phthalate may be isolated; the chemical does not represent a site-wide concern.

For pesticides, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT did not exceed any guideline at any location. Total DDT exceeded the lowest guideline (Dutch Target) at 7 of 19 locations but did not exceed any other guidelines. This is similar to the results (8 of 19 locations) reported for the comparisons to the USEPA Region 4 screening level. The lowest guideline for dieldrin (Dutch Target) is the same as the USEPA Region 4 screening values so the results (7 of 19 samples exceeded the guideline) are the same. Dieldrin concentrations did not exceed any of the other guidelines.

No guidelines were found for individual PCBs in the cited literature. Total PCB exceeded the lowest guideline (Dutch Target) in 3 of 19 samples and exceeded the next highest guideline (Beyer A) in 1 of 19 samples. Total PCB concentrations did not exceed any other guideline.

Antimony exceeded the lowest guideline (Dutch Target) and next lowest guideline (ORNL phytotoxicity) in 1 of 19 samples. Barium exceeded the lowest guideline (Dutch Target) and next lowest guideline (Beyer A) in 1 of 19 samples. No other guidelines were exceeded. This indicates potential risk from these metals might be very limited.

Cadmium exceeded the lowest guideline (Dutch Target) in 4 of 19 locations and the next lowest guideline (Beyer A) in 3 of 19 locations. The ORNL phytotoxicity, Beyer B, and CCME guidelines were exceeded in 2 of 19 locations, while the ORNL earthworm and Dutch Intervention values were not exceeded in any sample. Potential risk from cadmium appears to be very limited.

Chromium exceeded the lowest guideline (ORNL phytotoxicity) in 19 of 19 locations and the next lowest guideline (ORNL earthworm) in 10 of 19 locations. Chromium concentrations did not exceed any other guidelines. (It should be noted that the ORNL guideline is based on hexavalent chromium while soil analyses at Site 16 were for total chromium.) The lowest available guideline for total chromium (for which soil samples at this site were analyzed) is 64 mg/kg. Chromium concentrations at the site were well below this value.

Copper exceeded the lowest guideline (Dutch Target) and the next highest guidelines (Beyer A and ORNL Earthworm) in 4 of 19 samples. The next highest guideline (CCME) was exceeded in 3 of 19 samples. These results for copper are similar to those from comparison with the USEPA Region 4 screening levels and indicate although copper had a high frequency of detection, only a limited number of sample locations may have potential risk associated with them. Copper exceeded the highest guideline (Dutch Intervention) in 1 of 19 sample locations at sample 16S007. This is consistent with the presence of a potential hotspot at this location.

Lead exceeded the highest guideline (Dutch Intervention) in 1 of 19 sample locations at sample 16S007. This is consistent with the presence of a potential hotspot at this location. Mercury exceeded the lowest guideline (ORNL Earthworm) in 4 of 19 samples. This is the same guideline as the USEPA Region 4 screening value. Mercury exceeded the Dutch Target, ORNL Phytotoxicity and Beyer A values in 1 of 19 sample locations (location 16S007). This indicates potential risk from mercury might be isolated and the chemical does not represent site-wide potential risk. Zinc exceeded the lowest guideline (ORNL Phytotoxicity) in 6 of 19 samples, and the next highest guideline (ORNL Phytotoxicity) in 5 of 19 locations. Zinc exceeded the Beyer A, CCME, and Dutch Target guidelines in 2 of 19 samples. Zinc exceeded the highest guideline (Dutch Intervention) in 1 of 19 sample locations at sample 16S007. This is consistent with the presence of a potential hotspot at this location.

Comparisons of soil concentrations to guidelines other than USEPA Region 4 values corroborates the presence of areas of potential risk to soil invertebrates and plants. Sample location 16S007 appears to be a hotspot for several chemicals with concentrations exceeding both the USEPA Region 4 screening values and the other cited soil guidelines. Table 10-19 provides a summary of the COPCs and rationale for their selection following refinement analyses.

10.4.3 Soil Toxicity Testing

To evaluate potential effects of site contamination on soil invertebrates and plant life, toxicity testing was performed as described in the 2000 RI (see Appendix C). The toxicity tests were performed by Environmental Science and Engineering using earthworms and lettuce seeds as the test organisms. Samples submitted for toxicity testing included: 16S002, 16S003, 16S006 (which has since been excavated), 16S008, 16S012, and 16S013. A review of the toxicity testing report (ESE, 1996) indicated appropriate testing and quality control/quality assurance methodologies were used. The results of the earthworm toxicity testing indicated no significant difference in earthworm growth or survival between test, reference, and control samples. Based on this result, the 2000 RI concluded: “reduction in the survival and growth of terrestrial invertebrate communities at Site 16 is not likely". However, the results of the lettuce seed germination toxicity test indicated a significant difference in germination between sample location 16S012 and reference and control samples. A review of the surface soil analytical data indicated only two chemicals had their maximum concentrations at this location: benzo(g,h,i)perylene, and beryllium. Neither of these chemicals were detected at exceedingly elevated concentrations. The maximum concentration of beryllium was in fact less than the USEPA Region 4 soil screening level and not retained as a COPC. The 2000 RI stated there was no apparent correlation between COPC concentrations and the observed response, and it was likely a non-chemical stressor was responsible for the reduced germination at this location. Based on this result, the 2000 RI concluded “reductions in the survival and growth of terrestrial plant communities at Site 16 are not expected.” A review of the samples analyzed and the test organisms evaluated identified several uncertainties with these conclusions. Specifically:

- No rationale was given in the 2000 RI regarding the selection of sample locations to be submitted for toxicity testing.

- Toxicity testing was not performed on samples with the highest historical contaminant concentrations. Consequently, potential toxicity may be underestimated.

- The analysis of the correlation between COPC concentrations and observed effects referenced as being in Appendix H of the original RI was not found. No comparisons were made between COPC concentrations at the sample location with the demonstrated effect (16S012) and other locations with no effect to support conclusions regarding an absence of COPC-mediated toxicity.

The 2000 RI conclusions regarding an absence of potential risk to soil invertebrates and plants across Site 16 may underestimate potential risks to soil invertebrates and plants. Conclusions may be made regarding the presence or absence of toxicity at the sample locations included in the testing however, conclusions regarding all of Site 16 are not applicable.

10.4.4 <u>Uncertainties</u>

A discussion of uncertainties associated with ecological risk assessment was included in the 2000 RI and the companion General Information Report. While the uncertainty discussions in these documents adequately addressed general uncertainties in ecological risk assessment, the following uncertainties were identified specific to Site16 and the re-evaluation analyses.

- There is uncertainty regarding the areal extent of potential risk in the vicinity of samples 16S007 and 16S011.

- There is uncertainty in applying literature soil screening values due to potential differences in soil composition between Site 16 and those used in the cited studies. For example, the Dutch values are based on a standard soil containing 10 percent organic matter and 25 percent clay while the specific organic matter percentage in Site 16 soils is not known. The potential for underestimating risk may be reduced, however, through the use of the lowest applicable value for each COPC.

- There is uncertainty in conclusions based on the results of the soil toxicity testing. Uncertainties associated with selection of sample locations for testing, not testing locations with the highest contaminant concentrations, and uncertainty regarding the agent(s) associated with toxicity in plants may lead to an underestimate of potential risk.

- There is uncertainty regarding the source of chlorinated pesticides at Site 16. However, concentrations of pesticides at Site 16 are not extremely elevated and probably represent typical historic use.

- In the absence of avian toxicity reference values for silver, there is uncertainty regarding potential food chain risk to the bobwhite, robin, and hawk.

10.4.5 Conclusions

The 2000 RI ecological risk assessment performed for Whiting Field Site 16 has been re-evaluated and updated to reflect current USEPA and US Navy guidance. The following conclusions have been made based on the results of the re-evaluation:

- COPCs identified at Site 16 during screening level analyses include PAHs, chlorinated pesticides, PCBs, and metals.

- A large portion of the soil samples at Site 16 exceed the USEPA Region 4 screening levels indicating areas of potential risk to soil invertebrates and plants at the 12-acre site. However, comparisons of soil concentrations to guidelines other than USEPA Region 4 values suggest areas of potential impact to soil invertebrates and plants may be limited and are not site-wide.

- Pesticides identified as COPCs including DDT and its metabolites, and dieldrin may be non-site related and associated with historic applications at NAS Whiting Field.

- Chromium was only detected slightly above background concentrations. The screening value used in the analyses was for hexavalent chromium. Use of a screening value for total chromium indicates minimal potential risk from chromium.

- Based on spatial coverage and hazard quotients, lead and zinc are the major contributors to risk that may be site-related.

- Spatial analyses indicated that overall, the southern portion of Site 16 appears to have the largest affected areas for potential risk as well as the highest COPC concentrations.

- Spatial analyses indicated potential risk from 4,4'-DDD, aroclor-1260, antimony, arsenic, and barium were isolated to single sample locations and do not represent a site-wide risk.

- 1-methylnaphthalene, acenapthylene, and dibenzo(a,h)anthracene were each detected at only one sample location. Although potential ecological risk associated with these COPCs could not be estimated due to an absence of USEPA Region 4 screening levels, any potential risk is isolated to single sample locations and not site-wide.

- Food chain modeling for Site 16 indicated NOAEL-level risk for the shrew and robin from metals. LOAEL-level risk was seen only for the robin from lead.

- A contaminant hot spot containing the highest site concentrations of nine PAHs, two pesticides, and nine metals appears to be present at sample location 16S007.

- Removal of sample location 16S007 from the Site 16 direct-toxicity and food chain analyses resulted in a reduction in direct-toxicity HQ values and no LOAEL-level risk for the robin.

- Sample location 16S011 may represent another potential hot spot. Removal of sample location 16S007 from the Site 16 analyses results in 11 of 18 maximum concentrations (including elevated concentrations of three pesticides and eight metals) at 16S011.

- The areal extent of potential risk in the vicinity of samples 16S007 and 16S011 is unknown.

- Soil toxicity testing in the 2000 RI was not performed at the locations of highest historical contamination. There is uncertainty in the conclusion in the 2000 RI based on soil toxicity testing regarding an absence of site-wide potential risk to plants and soil invertebrates.

10.4.6 Summary

A screening level ecological risk assessment including Step 3A has been completed for surface soil at Whiting Field Site 16. Following an initial screening step where maximum site concentrations of contaminants were compared to conservative screening values, a list of COPCs was developed. COPCs consisted of PAHs, pesticides, PCBs, and metals. Bioaccumulative COPCs were analyzed in a food chain model to evaluate potential risks associated with consumption of contaminated food. The results of the food chain model indicated potential risks were primarily limited to lead. The list of COPCs was refined through an evaluation of spatial distribution, frequency of detection and detection limits, receptor home range, constituent bioavailability, and background. Additionally, COPC concentrations were compared to a variety of soil guidelines to reduce the uncertainty associated with using very conservative screening values, and to assist in characterizing spatial distribution of potential risk. The results of the refinement analyses indicated that based on spatial coverage and hazard quotients, lead and zinc contribute the most to site-related risk. The analyses further indicated that potential risk appears to be limited primarily to the vicinity of sampling locations 16S007 and 16S011. These locations contained elevated concentrations of multiple COPCs including lead and zinc.

TABLE 10-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
108-88-3	TOLUENE	1/19	0.001 J	0.001 J	0.006 - 0.013	16S00501	0.001	NA (13)	520 sat	520	380 N	7500	Kidney, Liver, Neurological	48	2.6E-06	No	BSL
1330-20-7	TOTAL XYLENES	3/19	0.001 J	0.005 J	0.011 - 0.013	16-SL-01	0.005	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	740	8.5E-07	No	BSL
	Semivolatile Organics (mg/kg)																
90-12-0	1-METHYLNAPHTHALENE	1/8	0.041	0.041	0.01 - 0.024	16SO2401	0.041	NA	56 N	5.6	68 N	93	Body Weight, Nasal	10	6.0E-04	No	BSL
208-96-8	ACENAPHTHYLENE	1/27	0.007	0.007	0.0071 - 0.42	16SO2501	0.007	NA	3700 N	370	1100 N	1800	Liver, Body Weight	160	6.4E-06	No	BSL, FREQ
191-24-2	BENZO(G,H,I)PERYLENE	9/27	0.0047 J	0.49	0.0071 - 0.42	16S01201	0.49	NA	2300 N	230	2300 N	2500	Neurological	290	2.1E-04	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/19	0.043 J	0.11 J	0.35 - 0.42	16S00701	0.11	NA	35 C	3	76 C	72	---	6	1.4E-03	No	BSL
206-44-0	FLUORANTHENE	9/27	0.011	0.26 J	0.012 - 0.42	16S00701	0.26	NA	2300 N	230	2900 N	3200	Blood, Kidney, Liver	580	9.0E-05	No	BSL
91-20-3	NAPHTHALENE	1/27	0.027	0.027	0.0071 - 0.42	16SO2501	0.027	NA	56 N	6	40 N	55	Body Weight, Nasal	6	6.8E-04	No	BSL, FREQ
85-01-8	PHENANTHRENE	6/27	0.0046 J	0.052 J	0.007 - 0.42	16S00701	0.052	NA	2300 N	230	2000 N	2200	Kidney	400	2.6E-05	No	BSL
129-00-0	PYRENE	9/27	0.0053 J	0.17 J	0.012 - 0.42	16S00701	0.17	NA	2300 N	230	2200 N	2400	Kidney	440	7.7E-05	No	BSL
50-32-8	BAP EQUIVALENT	9/27		0.51	0.0071 - 0.42	16S00701	0.51	NA	0.062 C	0.005	0.1 C	0.1	---	0.008	5.1E+00	Yes	ASL
	Pesticides PCBs (mg/kg)																
72-54-8	4,4'-DDD	2/19	0.0021 J	0.018 J	0.0035 - 0.02	16S00701	0.018	NA	2.4 C	0.2	4.6 C	4.2	---	0.4	3.9E-03	No	BSL
72-55-9	4,4'-DDE	8/19	0.002 J	0.053	0.0036 - 0.018	16S00701	0.053	NA	1.7 C	0.1	3.3 C	2.9	---	0.3	1.6E-02	No	BSL
50-29-3	4,4'-DDT	8/19	0.0027 J	0.028	0.0036 - 0.018	16S01101	0.028	NA	1.7 C	0.1	3.3 C	2.9	---	0.3	8.5E-03	No	BSL
5103-71-9	ALPHA-CHLORDANE	3/19	0.0016 J	0.012 J	0.0018 - 0.099	16S01001-D	0.012	NA	1.6 C	0.1	3.1 C	---	---	0.3	3.9E-03	No	BSL
11097-69-1	AROCLOR-1254	2/19	0.036 J	0.13	0.035 - 0.2	16S00801	0.13	NA	0.22 C	0.017	0.5 C	0.5	---	0.042	2.6E-01	Yes	ASL
11096-82-5	AROCLOR-1260	1/19	0.048 J	0.11 J	0.036 - 0.2	16S01001-D	0.11	NA	0.22 C	0.017	0.5 C	0.5	---	0.042	2.2E-01	Yes	ASL
60-57-1	DIELDRIN	7/19	0.0025 J	0.06	0.0036 - 0.02	16S01001-D	0.06	NA	0.03 C	0.002	0.07 C	0.06	---	0.006	8.6E-01	Yes	ASL
5103-74-2	GAMMA-CHLORDANE	3/19	0.001 J	0.0079 J	0.0018 - 0.099	16S01001-D	0.0079	NA	1.6 C	0.1	3.1 C	---	---	0.3	2.5E-03	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	19/19	1780 J	18600	---	16-SL-02	18600	no	76000 N	7600	72000 N	80000	Body Weight	18000	2.6E-01	No	BKG
7440-36-0	ANTIMONY	1/19	5.9 J	5.9 J	2.7 - 12	16S00701	5.9	yes	31 N	3.1	26 N	27	Blood, Mortality	6.5	2.3E-01	Yes	ASL
7440-38-2	ARSENIC	19/19	0.64 J	12.1	---	16S01101	12.1	no	0.39 C	0.03	0.8 C	2.1	---	0.067	1.5E+01	No	BKG
7440-39-3	BARIUM	19/19	4 J	257	---	16S00701	257	yes	5400 N	540	110 N	120	Cardiovascular	110	2.3E+00	Yes	ASL
7440-41-7	BERYLLIUM	14/19	0.06 J	0.23 J	1	16S01201	0.23	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.9E-03	No	BSL
7440-43-9	CADMIUM	16/19	0.21 J	7.6	0.61 - 1	16S00701	7.6	yes	37 N	3.7	75 N	82	Kidney	75	1.0E-01	Yes	ASL
7440-70-2	CALCIUM	19/19	70.8 J	2350	---	16S00701	2350	NE	---	---	---	---	---	---		No	NUT
7440-47-3	CHROMIUM	19/19	3.2	29.2	---	16S00701	29.2	Yes	210 C	16	210 C	210	---	17.5	1.4E-01	Yes	ASL
7440-48-4	COBALT	10/19	0.69 J	4.1 J	10	16S00701	4.1	NE	900 C	69	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	588	8.7E-04	No	BSL
7440-50-8	COPPER	18/19	2.9 J	202	5	16S00701	202	Yes	3100 N	310	110 N	150	Gastrointestinal	110	1.8E+00	Yes	ASL
7439-89-6	IRON	19/19	1310 J	48900	---	16S01101	48900	no	23000 N	2300	23000 N	53000	Blood, Gastrointestinal	5750	2.1E+00	No	BKG
7439-92-1	LEAD	19/19	4.4 J	759	---	16S00701	759	yes	400	400	400	400	---	400	1.9E+00	Yes	ASL
7439-95-4	MAGNESIUM	19/19	29.9 J	443 J	---	16S00701	443	NE	---	---	---	---	---	---		No	NUT
7439-96-5	MANGANESE	19/19	4.9	372	---	16S01401	372	no	1800 N	180	1600 N	3500	Neurological	200	2.3E-01	No	BKG
7439-97-6	MERCURY	8/19	0.05 J	0.65 J	0.08 - 0.1	16S00701	0.65	yes	23 N	2.3	3.4 N	3	Neurological	0.43	1.9E-01	Yes	ASL
7440-02-0	NICKEL	10/19	1.9 J	26	2.4 - 8	16S01101	26	NE	1600 N	160	110 N	340	Body Weight	110	2.4E-01	No	BSL
7440-09-7	POTASSIUM	6/19	69.7 J	230 J	133 - 1000	16-SL-03	230	NE	---	---	---	---	---	---		No	NUT
7782-49-2	SELENIUM	7/19	0.13 J	0.2 J	0.41 - 1	16S01501	0.2	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	48.8	5.1E-04	No	BSL
7440-22-4	SILVER	5/19	0.87 J	7.1	0.33 - 2	16S00701	7.1	NE	390 N	39	390 N	410	Skin	195	1.8E-02	No	BSL
7440-23-5	SODIUM	17/19	114 J	361 J	1000	16S00701	361	NE	---	---	---	---	---	---		No	NUT
7440-28-0	THALLIUM	2/19	0.13 J	0.18 J	0.46 - 2	16S00301	0.18	NE	5.2 N	0.52	6.3 N	6.1	Liver	1.6	2.9E-02	No	BSL
7440-62-2	VANADIUM	19/19	3.2 J	28.9	---	16-SL-02	28.9	no	550 N	55	15 N	67	NOEL	15	1.9E+00	No	BKG
7440-66-6	ZINC	19/19	3.4 J	773	---	16S00701	773	NE	23000 N	2300	23000 N	26000	Blood	5750	3.4E-02	No	BSL

TABLE 10-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	7/19	0.1 J	0.51 J	0.24 - 0.5	16S01501	0.51	NE	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	1.7E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 13 chemicals detected in surface soil at Site 16 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 13. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/.
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 12 carcinogens were detected in surface soil at Site 16. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 12. For noncarcinogens, neurological effects were identified as the target organ for 8 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 8. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL, and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

16-SL-01	16S00301	16S01001	16S01501	16SO2801
16-SL-02	16S00401	16S01001-D	16S01601	16SO3201
16-SL-03	16S00501	16S01101	16S01701	16SO3301
16S00101	16S00701	16S01201	16SO2401	16SO3401
16S00101-D	16S00801	16S01301	16SO2501	16SO3501
16S00201	16S00901	16S01401	16SO2601	

TABLE 10-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN- SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
78-93-3	2-BUTANONE	1/5	0.019	0.019	0.011 - 0.012	16SS0604	0.019	NA (13)	7300 N	730	3100 N	16000	Developmental	1000	6.1E-06	No	BSL
67-64-1	ACETONE	1/5	0.087 J	0.087 J	0.011 - 0.15	16SS0604	0.087	NA	1600 N	160	780 N	11000	Kidney, Liver, Neurological	98	1.1E-04	No	BSL
75-15-0	CARBON DISULFIDE	5/5	0.001 J	0.026	---	16SS0201	0.026	NA	360 N	36	200 N	270	Developmental, Neurological	25	1.3E-04	No	BSL
100-41-4	ETHYLBENZENE	1/5	0.002 J	0.002 J	0.011 - 0.012	16SS0403	0.002	NA	400 sat	400	1100 N	1500	Developmental, Kidney, Liver	160	1.8E-06	No	BSL
75-09-2	METHYLENE CHLORIDE	1/5	0.15 J	0.15 J	0.019 - 0.12	16SS0403	0.15	NA	9.1 C	0.91	16 C	17	---	2	9.4E-03	No	BSL
108-88-3	TOLUENE	1/5	0.001 J	0.001 J	0.011 - 0.012	16SS0201	0.001	NA	520 sat	520	380 N	7500	Kidney, Liver, Neurological	48	2.6E-06	No	BSL
1330-20-7	TOTAL XYLENES	5/5	0.002 J	0.011 J	---	16SS0201	0.011	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	740	1.9E-06	No	BSL
	Semivolatile Organics (mg/kg)																
91-57-6	2-METHYLNAPHTHALENE	1/5	0.039 J	0.039 J	0.37 - 0.43	16SS0201	0.039	NA	56 N	5.6	80 N	210	Body Weight, Nasal	13	4.9E-04	No	BSL
83-32-9	ACENAPHTHENE	1/5	0.077 J	0.077 J	0.37 - 0.43	16SS0604	0.077	NA	3700 N	370	1900 N	2400	Liver	380	4.1E-05	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/5	0.039 J	0.15 J	0.37 - 0.43	16SS0604	0.15	NA	35 C	4	76 C	72	---	8	2.0E-03	No	BSL
206-44-0	FLUORANTHENE	2/5	0.12 J	0.27 J	0.37 - 0.43	16SS0604	0.27	NA	2300 N	230	2900 N	3200	Blood, Kidney, Liver	410	9.3E-05	No	BSL
86-73-7	FLUORENE	1/5	0.11 J	0.11 J	0.37 - 0.43	16SS0604	0.11	NA	2700 N	270	2200 N	2600	Blood	440	5.0E-05	No	BSL
91-20-3	NAPHTHALENE	1/5	0.039 J	0.039 J	0.37 - 0.43	16SS0201	0.039	NA	56 N	6	40 N	55	Body Weight, Nasal	7	9.8E-04	No	BSL
85-01-8	PHENANTHRENE	2/5	0.058 J	0.34 J	0.37 - 0.43	16SS0604	0.34	NA	2300 N	230	2000 N	2200	Kidney	290	1.7E-04	No	BSL
129-00-0	PYRENE	2/5	0.077 J	0.19 J	0.37 - 0.43	16SS0604	0.19	NA	2300 N	230	2200 N	2400	Kidney	310	8.6E-05	No	BSL
50-32-8	**BAP EQUIVALENT**	1/5		0.052	0.37 - 0.43	16SS0604	0.052	NA	0.062 C	**0.0062**	0.1 C	0.1	---	**0.01**	5.2E-01	**Yes**	**ASL**
	Pesticides PCBs (mg/kg)																
72-54-8	4,4'-DDD	3/5	0.0022 J	0.036 J	0.0037 - 0.0043	16SS0604	0.036	NA	2.4 C	0.2	4.6 C	4.2	---	0.5	7.8E-03	No	BSL
72-55-9	4,4'-DDE	3/5	0.0018 J	0.083	0.0037 - 0.0043	16SS1005	0.083	NA	1.7 C	0.2	3.3 C	2.9	---	0.4	2.5E-02	No	BSL
50-29-3	4,4'-DDT	2/5	0.0057 J	0.052	0.0037 - 0.0043	16SS1005	0.052	NA	1.7 C	0.2	3.3 C	2.9	---	0.4	1.6E-02	No	BSL
60-57-1	DIELDRIN	1/5	0.0016 J	0.0016 J	0.0037 - 0.0076	16SS0201	0.0016	NA	0.03 C	0.003	0.07 C	0.06	---	0.008	2.3E-02	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	5/5	11000	29000	---	16SS0403	29000	no	76000 N	**7600**	72000 N	80000	Body Weight	**12000**	4.0E-01	No	BKG
7440-36-0	ANTIMONY	3/5	2.5 J	6.7 J	2.4 - 2.6	16SS0604	6.7	no	31 N	**3.1**	26 N	27	Blood, Mortality	**5.2**	2.6E-01	No	BKG
7440-38-2	ARSENIC	5/5	1.5 J	15.1	---	16SS0604	15.1	no	0.39 C	**0.039**	0.8 C	2.1	---	**0.089**	**1.9E+01**	No	BKG
7440-39-3	**BARIUM**	5/5	19 J	175	---	16SS0604	175	yes	5400 N	540	110 N	120	Cardiovascular	**110**	1.6E+00	**Yes**	**ASL**
7440-41-7	BERYLLIUM	5/5	0.18 J	0.29 J	---	16SS0403-D	0.29	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	2.4E-03	No	BSL
7440-43-9	**CADMIUM**	3/5	2.4 J	9	0.67 - 0.74	16SS0604	9	yes	37 N	**3.7**	75 N	82	Kidney	75	1.2E-01	**Yes**	**ASL**
7440-70-2	CALCIUM	4/5	254 J	5870	478 - 542	16SS0604	5870		---	---	---	---	---	---	---	No	NUT
7440-47-3	**CHROMIUM**	5/5	10.5	36.9	---	16SS1005	36.9	yes	210 C	**21**	210 C	210	---	**23.3**	1.8E-01	**Yes**	**ASL**
7440-48-4	COBALT	5/5	1.1 J	9.6 J	---	16SS1005	9.6	NE	900 C	90	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	588	2.0E-03	No	BSL
7440-50-8	**COPPER**	5/5	4.8 J	3620	---	16SS1005	3620	yes	3100 N	**310**	110 N	150	Gastrointestinal	**110**	**3.3E+01**	**Yes**	**ASL**
7439-89-6	IRON	5/5	6670	74800	---	16SS1005	74800	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**4600**	**3.3E+00**	No	BKG
7439-92-1	**LEAD**	5/5	6.8	766	---	16SS0604	766	yes	400	**400**	400	400	---	**400**	1.9E+00	**Yes**	**ASL**
7439-95-4	MAGNESIUM	5/5	185 J	586 J	---	16SS0604	586	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	5/5	39.9	638	---	16SS1005	638	no	1800 N	**180**	1600 N	3500	Neurological	**200**	4.0E-01	No	BKG
7439-97-6	MERCURY	4/5	0.17 J	0.43 J	0.1 - 0.14	16SS0302	0.43	yes	23 N	2.3	3.4 N	3	Neurological	0.43	1.3E-01	No	BSL
7440-02-0	NICKEL	5/5	2.3 J	35.9	---	16SS1005	35.9	NE	1600 N	160	110 N	340	Body Weight	110	3.3E-01	No	BSL
7440-09-7	POTASSIUM	4/5	166 J	412 J	153	16SS0604	412	NE	---	---	---	---	---	---	---	No	NUT
7440-22-4	SILVER	3/5	0.79 J	4.3	0.46 - 0.7	16SS0604	4.3	NE	390 N	39	390 N	410	Skin	390	1.1E-02	No	BSL
7440-23-5	SODIUM	4/5	207 J	514 J	223 - 225	16SS0604	514	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	5/5	19	67.5	---	16SS0403-D	67.5	no	550 N	**55**	15 N	67	NOEL	**15**	**4.5E+00**	No	BKG
7440-66-6	ZINC	5/5	10.6 J	895	---	16SS1005	895	NE	23000 N	2300	23000 N	26000	Blood	4600	3.9E-02	No	BSL

TABLE 10-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN- SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 2 OF 2

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	1/4	0.14 J	0.14 J	0.09 - 0.11	16SS1005	0.14	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	4.7E-03	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 10 chemicals detected in subsurface soil at Site 16 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 10. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs ARE are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 9 carcinogens were detected in subsurface soil at Site 16. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 9. For noncarcinogens, neurological effects were identified as the target organ for 8 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 8. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Associated Samples:
16SS0201
16SS0302
16SS0403
16SS0403-D
16SS0604
16SS1005

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

TABLE 10-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 16, OPEN DISPOSAL AND BURNING AREA
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	5E-06	- -	- -	Carcinogenic PAHs	0.4	- -
	Subsurface Soil	6E-07	- -	- -	- -	1	- -
Industrial Workers	Surface Soil	9E-07	- -	- -	- -	0.04	- -
	Subsurface Soil	2E-07	- -	- -	- -	0.08	- -
Construction Workers	Surface Soil	1E-06	- -	- -	- -	0.2	- -
	Subsurface Soil	2E-06	- -	- -	Chromium	0.6	- -
Maintenance Workers	Surface Soil	2E-07	- -	- -	- -	0.003	- -
Adolescent Recreational Users	Surface Soil	3E-07	- -	- -	- -	0.009	- -
Adult Recreational Users	Surface Soil	3E-07	- -	- -	- -	0.005	- -
Lifelong Recreational Users	Surface Soil	6E-07	- -	- -	- -	NA	- -

Notes:
NA - Not applicable.
HI - Hazard Index.

TABLE 10-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
108-88-3	TOLUENE	0.001 J	0.001	380 N	2.6E-06	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.005 J	0.005	5900 N	8.5E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
90-12-0	1-METHYLNAPHTHALENE	0.041	0.02	68 N	6.0E-04	NA	No	maximum < SCTL
208-96-8	ACENAPHTHYLENE	0.007	0.007	1100 N	6.4E-06	NA	No	maximum < SCTL
191-24-2	BENZO(G,H,I)PERYLENE	0.49	0.2	2300 N	2.1E-04	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.11 J	0.11	76 C	1.4E-03	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.26 J	0.2	2900 N	9.0E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.027	0.027	40 N	6.8E-04	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.052 J	0.052	2000 N	2.6E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	0.17 J	0.2	2200 N	7.7E-05	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	0.51	0.4	0.1 C	**5.1E+00**	NA	**Yes**	maximum > SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.018 J	0.006	4.6 C	3.9E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.053	0.02	3.3 C	1.6E-02	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.028	0.009	3.3 C	8.5E-03	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.012 J	0.009	3.1 C	3.9E-03	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.13	0.06	0.5 C	2.6E-01	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.11 J	0.05	0.5 C	2.2E-01	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.06	0.01	0.07 C	8.6E-01	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.0079 J	0.006	3.1 C	2.5E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	18600	11500	72000 N	2.6E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	5.9 J	5.9	26 N	2.3E-01	yes	No	maximum < SCTL
7440-38-2	ARSENIC	12.1	3.9	0.8 C	**1.5E+01**	no	No	(8)
7440-39-3	**BARIUM**	257	67.1	110 N	**2.3E+00**	yes	**Yes**	maximum > SCTL
7440-41-7	BERYLLIUM	0.23 J	0.23	120 N	1.9E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	7.6	1.9	75 N	1.0E-01	no	No	maximum < SCTL
7440-70-2	CALCIUM	2350	1260	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	29.2	15.2	210 C	1.4E-01	NE	No	maximum < SCTL
7440-48-4	COBALT	4.1 J	3.9	4700 N	8.7E-04	NE	No	maximum < SCTL
7440-50-8	**COPPER**	202	51.1	110 N	**1.8E+00**	yes	**Yes**	maximum > SCTL
7439-89-6	IRON	48900	14000	23000 N	**2.1E+00**	no	No	(8)
7439-92-1	**LEAD**	759	103	400	**1.9E+00**	yes	**Yes**	maximum > SCTL
7439-95-4	MAGNESIUM	443 J	222	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	372	329	1600 N	2.3E-01	no	No	(8)

TABLE 10-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7439-97-6	MERCURY	0.65 J	0.16	3.4	N	1.9E-01	yes	No	maximum < SCTL
7440-02-0	NICKEL	26	7.7	110	N	2.4E-01	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	230 J	230	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.2 J	0.2	390	N	5.1E-04	NE	No	maximum < SCTL
7440-22-4	SILVER	7.1	2	390	N	1.8E-02	NE	No	maximum < SCTL
7440-23-5	SODIUM	361 J	248	---		---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.18 J	0.18	6.3	N	2.9E-02	NE	No	maximum < SCTL
7440-62-2	VANADIUM	28.9	21.8	15	N	1.9E+00	no	No	(8)
7440-66-6	ZINC	773	171	23000	N	3.4E-02	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.51 J	0.24	30	N	1.7E-02	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 16 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

16-SL-01	16S00301	16S01001	16S01501	16SO2801
16-SL-02	16S00401	16S01001-D	16S01601	16SO3201
16-SL-03	16S00501	16S01101	16S01701	16SO3301
16S00101	16S00701	16S01201	16SO2401	16SO3401
16S00101-D	16S00801	16S01301	16SO2501	16SO3501
16S00201	16S00901	16S01401	16SO2601	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COC = Chemical of Concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 10-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Range of Nondetects	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)							
108-88-3	TOLUENE	1/19	0.001 J	0.001	0.006 - 0.013	16S00501	NA (5)	650
1330-20-7	TOTAL XYLENES	3/19	0.005 J	0.005	0.011 - 0.013	16-SL-01	NA	140
	Semivolatile Organics (mg/kg)							
90-12-0	1-METHYLNAPHTHALENE	1/8	0.041	0.02	0.01 - 0.024	16SO2401	NA	410
208-96-8	ACENAPHTHYLENE	1/27	0.007	0.007	0.0071 - 0.42	16SO2501	NA	---
191-24-2	BENZO(G,H,I)PERYLENE	9/27	0.49	0.2	0.0071 - 0.42	16S01201	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/19	0.11 J	0.11	0.35 - 0.42	16S00701	NA	31000
206-44-0	FLUORANTHENE	9/27	0.26 J	0.2	0.012 - 0.42	16S00701	NA	---
91-20-3	NAPHTHALENE	1/27	0.027	0.027	0.0071 - 0.42	16SO2501	NA	220
85-01-8	PHENANTHRENE	6/27	0.052 J	0.052	0.007 - 0.42	16S00701	NA	---
129-00-0	PYRENE	9/27	0.17 J	0.2	0.012 - 0.42	16S00701	NA	85
50-32-8	BAP EQUIVALENT	9/27	0.51	0.4	0.0071 - 0.42	16S00701	NA	---
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	2/19	0.018 J	0.006	0.0035 - 0.02	16S00701	NA	---
72-55-9	4,4'-DDE	8/19	0.053	0.02	0.0036 - 0.018	16S00701	NA	---
50-29-3	4,4'-DDT	8/19	0.028	0.009	0.0036 - 0.018	16S01101	NA	---
5103-71-9	ALPHA-CHLORDANE	3/19	0.012 J	0.009	0.0018 - 0.099	16S01001-D	NA	---
11097-69-1	AROCLOR-1254	2/19	0.13	0.06	0.035 - 0.2	16S00801	NA	---
11096-82-5	AROCLOR-1260	1/19	0.11 J	0.05	0.036 - 0.2	16S01001-D	NA	---
60-57-1	DIELDRIN	7/19	0.06	0.01	0.0036 - 0.02	16S01001-D	NA	---
5103-74-2	GAMMA-CHLORDANE	3/19	0.0079 J	0.006	0.0018 - 0.099	16S01001-D	NA	---

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

TABLE 10-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Range of Nondetects	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)

Associated Samples:

16-SL-01	16S00301	16S01001	16S01501	16SO2801
16-SL-02	16S00401	16S01001-D	16S01601	16SO3201
16-SL-03	16S00501	16S01101	16S01701	16SO3301
16S00101	16S00701	16S01201	16SO2401	16SO3401
16S00101-D	16S00801	16S01301	16SO2501	16SO3501
16S00201	16S00901	16S01401	16SO2601	

TABLE 10-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
108-88-3	TOLUENE	0.001 J	0.001	2600	N	3.8E-07	NA (6)	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.005 J	0.005	40000	N	1.3E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
90-12-0	1-METHYLNAPHTHALENE	0.041	0.02	470	N	8.7E-05	NA	No	maximum < SCTL
208-96-8	ACENAPHTHYLENE	0.007	0.007	11000	N	6.4E-07	NA	No	maximum < SCTL
191-24-2	BENZO(G,H,I)PERYLENE	0.49	0.2	41000	N	1.2E-05	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.11 J	0.11	280	C	3.9E-04	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.26 J	0.2	48000	N	5.4E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.027	0.027	270	N	1.0E-04	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.052 J	0.052	30000	N	1.7E-06	NA	No	maximum < SCTL
129-00-0	PYRENE	0.17 J	0.2	37000	N	4.6E-06	NA	No	maximum < SCTL
50-32-8	BAP EQUIVALENT	0.51	0.4	0.5	C	1.0E+00	NA	No	maximum = SCTL (proposed 2004 SCTL is 0.7 mg/kg)
	Pesticides PCBs (mg/kg)								
72-54-8	4,4'-DDD	0.018 J	0.006	18	C	1.0E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.053	0.02	13	C	4.1E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.028	0.009	13	C	2.2E-03	NA	No	maximum < SCTL
5103-71-9	ALPHA-CHLORDANE	0.012 J	0.009	12	C	1.0E-03	NA	No	maximum < SCTL
11097-69-1	AROCLOR-1254	0.13	0.06	2.1	C	6.2E-02	NA	No	maximum < SCTL
11096-82-5	AROCLOR-1260	0.11 J	0.05	2.1	C	5.2E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.06	0.01	0.3	C	2.0E-01	NA	No	maximum < SCTL
5103-74-2	GAMMA-CHLORDANE	0.0079 J	0.006	12	C	6.6E-04	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	18600	11500	---	N	---	no	No	maximum < SCTL
7440-36-0	ANTIMONY	5.9 J	5.9	240	N	2.5E-02	yes	No	maximum < SCTL
7440-38-2	ARSENIC	12.1	3.9	3.7	C	**3.3E+00**	no	No	(8)
7440-39-3	BARIUM	257	67.1	87000	N	3.0E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.23 J	0.23	800	N	2.9E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	7.6	1.9	1300	N	5.8E-03	no	No	maximum < SCTL
7440-70-2	CALCIUM	2350	1260	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	29.2	15.2	420	C	7.0E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	4.1 J	3.9	110000	N	3.7E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	202	51.1	76000	N	2.7E-03	yes	No	maximum < SCTL
7439-89-6	IRON	48900	14000	480000	N	1.0E-01	no	No	maximum < SCTL
7439-92-1	LEAD	759	103	920		8.3E-01	yes	No	maximum < SCTL
7439-95-4	MAGNESIUM	443 J	222	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	372	329	22000	N	1.7E-02	no	No	maximum < SCTL

TABLE 10-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7439-97-6	MERCURY	0.65 J	0.16	26	N	2.5E-02	yes	No	maximum < SCTL
7440-02-0	NICKEL	26	7.7	28000	N	9.3E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	230 J	230	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	0.2 J	0.2	10000	N	2.0E-05	NE	No	maximum < SCTL
7440-22-4	SILVER	7.1	2	9100	N	7.8E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	361 J	248	---		---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.18 J	0.18	160	N	1.1E-03	NE	No	maximum < SCTL
7440-62-2	VANADIUM	28.9	21.8	7400	N	3.9E-03	no	No	maximum < SCTL
7440-66-6	ZINC	773	171	560000	N	1.4E-03	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.51 J	0.24	39000	N	1.3E-05	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 16 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

16-SL-01	16S00301	16S01001	16S01501	16SO2801
16-SL-02	16S00401	16S01001-D	16S01601	16SO3201
16-SL-03	16S00501	16S01101	16S01701	16SO3301
16S00101	16S00701	16S01201	16SO2401	16SO3401
16S00101-D	16S00801	16S01301	16SO2501	16SO3501
16S00201	16S00901	16S01401	16SO2601	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COC = Chemical of Concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 10-7

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.019	0.019	3100 N	6.1E-06	NA (6)	No	maximum < SCTL
67-64-1	ACETONE	0.087 J	0.087	780 N	1.1E-04	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.026	0.026	200 N	1.3E-04	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.002 J	0.002	1100 N	1.8E-06	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.15 J	0.15	16 C	9.4E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.001 J	0.001	380 N	2.6E-06	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.011 J	0.011	5900 N	1.9E-06	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	0.039 J	0.039	80 N	4.9E-04	NA	No	maximum < SCTL
83-32-9	ACENAPHTHENE	0.077 J	0.077	1900 N	4.1E-05	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.15 J	0.15	76 C	2.0E-03	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.27 J	0.27	2900 N	9.3E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.11 J	0.11	2200 N	5.0E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.039 J	0.039	40 N	9.8E-04	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.34 J	0.34	2000 N	1.7E-04	NA	No	maximum < SCTL
129-00-0	PYRENE	0.19 J	0.19	2200 N	8.6E-05	NA	No	maximum < SCTL
50-32-8	BAP EQUIVALENT	0.052	0.052	0.1 C	5.2E-01	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.036 J	0.036	4.6 C	7.8E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.083	0.083	3.3 C	2.5E-02	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.052	0.052	3.3 C	1.6E-02	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.0016 J	0.0016	0.07 C	2.3E-02	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	29000	29000	72000 N	4.0E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	6.7 J	6.7	26 N	2.6E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	15.1	15.1	0.8 C	**1.9E+01**	no	No	(8)
7440-39-3	**BARIUM**	175	175	110 N	**1.6E+00**	yes	**Yes**	maximum > SCTL
7440-41-7	BERYLLIUM	0.29 J	0.29	120 N	2.4E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	9	9	75 N	1.2E-01	yes	No	maximum < SCTL
7440-70-2	CALCIUM	5870	5870	---	---		No	Essential Nutrient
7440-47-3	CHROMIUM	36.9	36.9	210 C	1.8E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	9.6 J	9.6	4700 N	2.0E-03	NE	No	maximum < SCTL
7440-50-8	**COPPER**	3620	3620	110 N	**3.3E+01**	yes	**Yes**	maximum > SCTL
7439-89-6	IRON	74800	74800	23000 N	**3.3E+00**	no	No	(8)
7439-92-1	**LEAD**	766	286	400	**1.9E+00**	yes	**Yes**	maximum > SCTL
7439-95-4	MAGNESIUM	586 J	586	---	---	NE	No	Essential Nutrient

TABLE 10-7

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 2 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7439-96-5	MANGANESE	638	638	1600 N	4.0E-01	no	No	Background
7439-97-6	MERCURY	0.43 J	0.43	3.4 N	1.3E-01	yes	No	maximum < SCTL
7440-02-0	NICKEL	35.9	35.9	110 N	3.3E-01	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	412 J	412	---	---	NE	No	Essential Nutrient
7440-22-4	SILVER	4.3	4.3	390 N	1.1E-02	NE	No	maximum < SCTL
7440-23-5	SODIUM	514 J	514	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	67.5	67.5	15 N	**4.5E+00**	no	No	(8)
7440-66-6	ZINC	895	895	23000 N	3.9E-02	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.14 J	0.14	30 N	4.7E-03	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 16 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
16SS0201
16SS0302
16SS0403
16SS0403-D
16SS0604
16SS1005

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 10-8

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	1/5	0.019	0.019	16SS0604	NA (5)	25000
67-64-1	ACETONE	1/5	0.087 J	0.087	16SS0604	NA	100000
75-15-0	CARBON DISULFIDE	5/5	0.026	0.026	16SS0201	NA	730
100-41-4	ETHYLBENZENE	1/5	0.002 J	0.002	16SS0403	NA	400
75-09-2	METHYLENE CHLORIDE	1/5	0.15 J	0.15	16SS0403	NA	2400
108-88-3	TOLUENE	1/5	0.001 J	0.001	16SS0201	NA	650
1330-20-7	TOTAL XYLENES	5/5	0.011 J	0.011	16SS0201	NA	140
	Semivolatile Organics (mg/kg)						
91-57-6	2-METHYLNAPHTHALENE	1/5	0.039 J	0.039	16SS0201	NA	---
83-32-9	ACENAPHTHENE	1/5	0.077 J	0.077	16SS0604	NA	130
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2/5	0.15 J	0.15	16SS0604	NA	31000
206-44-0	FLUORANTHENE	2/5	0.27 J	0.27	16SS0604	NA	---
86-73-7	FLUORENE	1/5	0.11 J	0.11	16SS0604	NA	160
91-20-3	NAPHTHALENE	1/5	0.039 J	0.039	16SS0201	NA	220
85-01-8	PHENANTHRENE	2/5	0.34 J	0.34	16SS0604	NA	---
129-00-0	PYRENE	2/5	0.19 J	0.19	16SS0604	NA	85
50-32-8	BAP EQUIVALENT	1/5	0.052	0.052	16SS0604	NA	---
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	3/5	0.036 J	0.036	16SS0604	NA	---
72-55-9	4,4'-DDE	3/5	0.083	0.083	16SS1005	NA	---
50-29-3	4,4'-DDT	2/5	0.052	0.052	16SS1005	NA	---
60-57-1	DIELDRIN	1/5	0.0016 J	0.0016	16SS0201	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

16SS0201	16SS0403-D
16SS0302	16SS0604
16SS0403	16SS1005

TABLE 10-9

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.019	0.019	21000 N	9.0E-07	NA (6)	No	maximum < SCTL
67-64-1	ACETONE	0.087 J	0.087	5500 N	1.6E-05	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.026	0.026	1400 N	1.9E-05	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.002 J	0.002	8400 N	2.4E-07	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.15 J	0.15	23 C	6.5E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.001 J	0.001	2600 N	3.8E-07	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	0.011 J	0.011	40000 N	2.8E-07	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	0.039 J	0.039	560 N	7.0E-05	NA	No	maximum < SCTL
83-32-9	ACENAPHTHENE	0.077 J	0.077	18000 N	4.3E-06	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.15 J	0.15	280 C	5.4E-04	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	0.27 J	0.27	48000 N	5.6E-06	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.11 J	0.11	28000 N	3.9E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	0.039 J	0.039	270 N	1.4E-04	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.34 J	0.34	30000 N	1.1E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	0.19 J	0.19	37000 N	5.1E-06	NA	No	maximum < SCTL
50-32-8	BAP EQUIVALENT	0.052	0.052	0.5 C	1.0E-01	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.036 J	0.036	18 C	2.0E-03	NA	No	maximum < SCTL
72-55-9	4,4'-DDE	0.083	0.083	13 C	6.4E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.052	0.052	13 C	4.0E-03	NA	No	maximum < SCTL
60-57-1	DIELDRIN	0.0016 J	0.0016	0.3 C	5.3E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	29000	29000	--- N	---	no	No	(8)
7440-36-0	ANTIMONY	6.7 J	6.7	240 N	2.8E-02	no	No	maximum < SCTL
7440-38-2	ARSENIC	15.1	15.1	3.7 C	**4.1E+00**	no	No	(8)
7440-39-3	BARIUM	175	175	87000 N	2.0E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.29 J	0.29	800 N	3.6E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	9	9	1300 N	6.9E-03	yes	No	maximum < SCTL
7440-70-2	CALCIUM	5870	5870	---	---		No	Essential Nutrient
7440-47-3	CHROMIUM	36.9	36.9	420 C	8.8E-02	yes	No	maximum < SCTL
7440-48-4	COBALT	9.6 J	9.6	110000 N	8.7E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	3620	3620	76000 N	4.8E-02	yes	No	maximum < SCTL
7439-89-6	IRON	74800	74800	480000 N	1.6E-01	no	No	maximum < SCTL
7439-92-1	LEAD	766	286	920	8.3E-01	yes	No	maximum < SCTL
7439-95-4	MAGNESIUM	586 J	586	---	---	NE	No	Essential Nutrient

TABLE 10-9

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7439-96-5	MANGANESE	638	638	22000 N	2.9E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.43 J	0.43	26 N	1.7E-02	yes	No	maximum < SCTL
7440-02-0	NICKEL	35.9	35.9	28000 N	1.3E-03	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	412 J	412	---	---	NE	No	Essential Nutrient
7440-22-4	SILVER	4.3	4.3	9100 N	4.7E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	514 J	514	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	67.5	67.5	7400 N	9.1E-03	no	No	maximum < SCTL
7440-66-6	ZINC	895	895	560000 N	1.6E-03	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.14 J	0.14	39000 N	3.6E-06	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 16 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
16SS0201
16SS0302
16SS0403
16SS0403-D
16SS0604
16SS1005

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 10-10

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL USING MAXIMUM CONCENTRATIONS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration	Sample of Maximum Detection	Region 4 Eco SS Criteria	Maximum Hazard Quotient	COPC?	Notes
Volatile Organics (ug/kg)									
TOLUENE	1/19	1 J	1 J	5.11	16S00501	50	0.02	N	
TOTAL XYLENES	3/19	1 J	5 J	5.29	16-SL-01	50	0.1	N	
Semivolatile Organics (ug/kg)									
1-METHYLNAPHTHALENE	1/8	41	41	12.1	16SO2401	---	NA	**Y**	
ACENAPHTHYLENE	1/27	7	7	136	16SO2501	---	NA	**Y**	
BENZO(A)ANTHRACENE	11/27	3.2 J	250 J	137	16S00701	---	NA	**Y**	
BENZO(A)PYRENE	9/27	5.3 J	310 J	142	16S00701	100	**3.1**	**Y**	
BENZO(B)FLUORANTHENE	9/27	7 J	350 J	154	16S00701	---	NA	**Y**	
BENZO(G,H,I)PERYLENE	9/27	4.7 J	490	156	16S01201	---	NA	**Y**	
BENZO(K)FLUORANTHENE	6/27	7.7 J	340 J	142	16S00701	---	NA	**Y**	
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	43 J	110 J	143	16S00701	---	NA	**Y**	
CHRYSENE	11/27	4.4 J	270 J	133	16S00701	---	NA	**Y**	
DIBENZO(A,H)ANTHRACENE	1/27	110 J	110 J	132	16S00701	---	NA	**Y**	
FLUORANTHENE	9/27	11	260 J	138	16S00701	100	**2.6**	**Y**	
INDENO(1,2,3-CD)PYRENE	11/27	4.5 J	240 J	139	16S00701	---	NA	**Y**	
NAPHTHALENE	1/27	27	27	137	16SO2501	100	0.27	N	
PHENANTHRENE	6/27	4.6 J	52 J	132	16S00701	100	0.52	N	
PYRENE	9/27	5.3 J	170 J	133	16S00701	100	**1.7**	**Y**	
TOTAL PAHs		242.7	2917	1823		1000	**2.92**	**Y**	
Pesticides PCBs (ug/kg)									
4,4'-DDD	2/19	2.1 J	18 J	4.07	16S00701	2.5	**7.2**	**Y**	
4,4'-DDE	8/19	2 J	53	10.5	16S00701	2.5	**21.2**	**Y**	
4,4'-DDT	8/19	2.7 J	28	6.64	16S01101	2.5	**11.2**	**Y**	
TOTAL DDT		6.8	99	21.24		2.5	**39.6**		
DIELDRIN	7/19	2.5 J	60	8.64	16S01001-D	0.5	**120**	**Y**	
ALPHA-CHLORDANE	3/19	1.6 J	12 J	8.97	16S01001-D	---	NA	**Y**	
GAMMA-CHLORDANE	3/19	1 J	7.9 J	8.74	16S01001-D	---	NA	**Y**	
AROCLOR-1254	2/19	36 J	130	42.9	16S00801	20	**6.5**	**Y**	
AROCLOR-1260	1/19	48 J	110 J	39.1	16S01001-D	20	**5.5**	**Y**	
TOTAL PCBs		84	240	82.04		20	**12**	**Y**	
Inorganics (mg/kg)									
ALUMINUM	19/19	1780 J	18600	8768	16-SL-02	50	**372**	**Y**	
ANTIMONY	1/19	5.9 J	5.9 J	5.27	16S00701	3.5	**1.69**	**Y**	
ARSENIC	19/19	0.64 J	12.1	2.82	16S01101	10	**1.21**	**Y**	
BARIUM	19/19	4 J	257	36.0	16S00701	165	**1.56**	**Y**	
BERYLLIUM	14/19	0.06 J	0.23 J	0.209	16S01201	1.1	0.21	N	
CADMIUM	16/19	0.21 J	7.6	1.14	16S00701	1.6	**4.75**	**Y**	
CALCIUM	19/19	70.8 J	2350	572	16S00701	---	NA	N	nutrient
CHROMIUM	19/19	3.2	29.2	10.5	16S00701	0.4	**73**	**Y**	
COBALT	10/19	0.69 J	4.1 J	3.25	16S00701	20	0.21	N	
COPPER	18/19	2.9 J	202	30.5	16S00701	40	**5.05**	**Y**	
IRON	19/19	1310 J	48900	9184	16S01101	200	**244.5**	**Y**	
LEAD	19/19	4.4 J	759	103	16S00701	50	**15.18**	**Y**	
MAGNESIUM	19/19	29.9 J	443 J	157	16S00701	---	NA	N	nutrient
MANGANESE	19/19	4.9	372	129	16S01401	100	**3.72**	**Y**	
MERCURY	8/19	0.05 J	0.65 J	0.101	16S00701	0.1	**6.5**	**Y**	
NICKEL	10/19	1.9 J	26	5.48	16S01101	30	0.87	N	
POTASSIUM	6/19	69.7 J	230 J	336	16-SL-03	---	NA	N	nutrient
SELENIUM	7/19	0.13 J	0.2 J	0.332	16S01501	0.81	0.25	N	
SILVER	5/19	0.87 J	7.1	1.46	16S00701	2	**3.55**	**Y**	
SODIUM	17/19	114 J	361 J	205	16S00701	---	NA	N	nutrient
THALLIUM	2/19	0.13 J	0.18 J	0.791	16S00301	1	0.18	N	
VANADIUM	19/19	3.2 J	28.9	15.8	16-SL-02	2	**14.45**	**Y**	
ZINC	19/19	3.4 J	773	101	16S00701	50	**15.46**	**Y**	
Miscellaneous Parameter (mg/kg)									
CYANIDE	7/19	0.1 J	0.51 J	0.211	16S01501	0.9	0.57	N	

COPC - Chemical of Potential Concern
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 10-11

HAZARD QUOTIENTS USING MAXIMUM SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - CONSERVATIVE INPUTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse NOAEL HQ	Shrew NOAEL HQ	Bobwhite NOAEL HQ	Robin NOAEL HQ	Hawk NOAEL HQ	Fox NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	3.28E-04	3.31E-02	1.81E-03	6.97E-01	8.10E-03	1.12E-03
4,4'-DDE	9.87E-04	9.73E-02	5.35E-03	**2.05E+00**	6.90E-03	9.58E-04
4,4'-DDT	4.73E-04	5.14E-02	2.75E-03	**1.08E+00**	1.26E-02	1.75E-03
DDTR	1.67E-03	1.82E-01	9.73E-03	**3.83E+00**	3.06E-01	4.24E-02
ALPHA-CHLORDANE	4.08E-05	1.57E-03	5.16E-05	8.01E-03	6.06E-04	3.48E-04
GAMMA-CHLORDANE	2.69E-05	1.33E-03	3.40E-05	6.79E-03	5.25E-04	3.01E-04
DIELDRIN	6.95E-02	**2.33E+00**	8.17E-03	**1.43E+00**	1.01E-01	4.79E-01
AROCLOR-1254	2.69E-02	**1.49E+00**	6.46E-03	**1.34E+00**	3.80E-01	**1.24E+00**
AROCLOR-1260	2.09E-02	**1.26E+00**	5.34E-03	**1.13E+00**	3.22E-01	**1.05E+00**
TOTAL PCB	0.00E+00	**2.75E+00**	1.19E-02	**2.47E+00**	7.01E-01	**2.29E+00**
Metals and Inorganic Compounds						
ARSENIC	**1.88E+00**	**8.95E+00**	4.85E-02	**1.09E+00**	1.85E-02	4.46E-01
CADMIUM	1.79E-01	**6.78E+00**	5.52E-02	**1.11E+01**	9.22E-02	1.65E-01
CHROMIUM	2.16E-04	1.09E-03	2.91E-01	**7.06E+00**	2.10E-01	9.47E-05
COPPER	6.18E-01	**2.15E+00**	5.42E-02	**1.27E+00**	5.10E-02	2.53E-01
LEAD	**1.88E+00**	**9.30E+00**	**6.66E+00**	**1.56E+02**	**5.42E+00**	9.44E-01
MERCURY	**2.74E+00**	**5.08E+00**	**2.98E+00**	**6.02E+01**	6.02E-01	1.49E-01
SILVER	4.48E-02	8.50E-01	NA	NA	NA	1.40E-02
ZINC	3.93E-01	**1.98E+00**	**1.08E+00**	**5.19E+01**	**1.91E+00**	2.14E-01

NOAEL - no observed adverse effect level
HQ - hazard quotient
NA - not available

TABLE 10-12

COMPARISON OF USEPA REGION 4 ECOLOGICAL SCREENING LEVELS TO SURFACE SOIL MEAN CONCENTRATIONS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration	Region 4 Eco SS Criteria	Mean Hazard Quotient
Semivolatile Organics (ug/kg)						
1-METHYLNAPHTHALENE	1/8	41	41	12.1	---	NA
ACENAPHTHYLENE	1/27	7	7	136	---	NA
BENZO(A)ANTHRACENE	11/27	3.2 J	250 J	137	---	NA
BENZO(A)PYRENE	9/27	5.3 J	310 J	142	100	**1.42**
BENZO(B)FLUORANTHENE	9/27	7 J	350 J	154	---	NA
BENZO(G,H,I)PERYLENE	9/27	4.7 J	490	156	---	NA
BENZO(K)FLUORANTHENE	6/27	7.7 J	340 J	142	---	NA
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	43 J	110 J	143	---	NA
CHRYSENE	11/27	4.4 J	270 J	133	---	NA
DIBENZO(A,H)ANTHRACENE	1/27	110 J	110 J	132	---	NA
FLUORANTHENE	9/27	11	260 J	138	100	**1.38**
INDENO(1,2,3-CD)PYRENE	11/27	4.5 J	240 J	139	---	NA
PYRENE	9/27	5.3 J	170 J	133	100	1.33
TOTAL PAHs		211	2838	1555	100	15.55
Pesticides PCBs (ug/kg)						
4,4'-DDD	2/19	2.1 J	18 J	4.07	2.5	**1.63**
4,4'-DDE	8/19	2 J	53	10.5	2.5	**4.21**
4,4'-DDT	8/19	2.7 J	28	6.64	2.5	**2.66**
TOTAL DDT		6.8	99	21.24	2.5	**8.49**
DIELDRIN	7/19	2.5 J	60	8.64	0.5	**17.27**
ALPHA-CHLORDANE	3/19	1.6 J	12 J	8.97	---	NA
GAMMA-CHLORDANE	3/19	1 J	7.9 J	8.74	---	NA
AROCLOR-1254	2/19	36 J	130	42.9	20	**2.15**
AROCLOR-1260	1/19	48 J	110 J	39.1	20	**1.96**
TOTAL PCBs		84	240	82.04	20	**4.10**
Inorganics (mg/kg)						
ALUMINUM	19/19	1780 J	18600	8768	50	**175.35**
ANTIMONY	1/19	5.9 J	5.9 J	5.27	3.5	**1.51**
ARSENIC	19/19	0.64 J	12.1	2.82	10	0.28
BARIUM	19/19	4 J	257	36.0	165	0.22
BERYLLIUM	14/19	0.06 J	0.23 J	0.209	1.1	0.19
CADMIUM	16/19	0.21 J	7.6	1.14	1.6	0.71
CALCIUM	19/19	70.8 J	2350	572	---	NA
CHROMIUM	19/19	3.2	29.2	10.5	0.4	**26.25**
COBALT	10/19	0.69 J	4.1 J	3.25	20	0.16
COPPER	18/19	2.9 J	202	30.5	40	0.76
IRON	19/19	1310 J	48900	9184	200	**45.92**
LEAD	19/19	4.4 J	759	103	50	**2.07**
MAGNESIUM	19/19	29.9 J	443 J	157	---	NA
MANGANESE	19/19	4.9	372	129	100	**1.29**
MERCURY	8/19	0.05 J	0.65 J	0.101	0.1	**1.01**
POTASSIUM	6/19	69.7 J	230 J	336	---	NA
SILVER	5/19	0.87 J	7.1	1.46	2	0.73
SODIUM	17/19	114 J	361 J	205	---	NA
VANADIUM	19/19	3.2 J	28.9	15.8	2	**7.91**
ZINC	19/19	3.4 J	773	101	50	**2.03**

NA - not available
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 10-13

HAZARD QUOTIENTS USING MEAN SURFCE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ
Pesticides and PCBs												
4,4'-DDE	8.40E-05	1.68E-05	1.61E-02	3.22E-03	7.79E-04	7.79E-05	3.11E-01	3.11E-02	1.04E-03	1.04E-04	1.12E-04	2.23E-05
4,4'-DDT	4.81E-05	9.63E-06	1.02E-02	2.03E-03	4.79E-04	4.79E-05	1.96E-01	1.96E-02	2.26E-03	2.26E-04	2.44E-04	4.87E-05
DDTR	1.54E-04	3.08E-05	3.25E-02	6.49E-03	1.53E-03	1.53E-04	6.27E-01	6.27E-02	4.96E-02	4.96E-03	5.34E-03	1.07E-03
DIELDRIN	4.29E-03	4.29E-04	2.79E-01	2.79E-02	8.62E-04	8.62E-05	1.57E-01	1.57E-02	1.10E-02	1.10E-03	4.05E-02	4.05E-03
AROCLOR-1254	3.81E-03	3.81E-04	4.10E-01	4.10E-02	1.56E-03	1.56E-04	3.36E-01	3.36E-02	9.49E-02	9.49E-03	2.40E-01	2.40E-02
AROCLOR-1260	3.18E-03	1.20E-04	3.74E-01	1.41E-02	1.39E-03	1.39E-04	3.07E-01	3.07E-02	8.65E-02	8.65E-03	2.19E-01	8.28E-03
TOTAL PCB	7.28E-03	7.28E-04	7.84E-01	7.84E-02	2.99E-03	2.99E-04	6.43E-01	6.43E-02	1.81E-01	1.81E-02	4.59E-01	4.59E-02
Metals and Inorganic Compounds												
ARSENIC	1.88E-01	1.88E-02	**1.74E+00**	1.74E-01	8.30E-03	2.77E-03	1.93E-01	6.44E-02	3.26E-03	1.09E-03	6.09E-02	6.09E-03
CADMIUM	1.15E-02	1.15E-03	8.44E-01	8.44E-02	6.06E-03	4.40E-04	**1.26E+00**	9.16E-02	1.04E-02	7.56E-04	1.45E-02	1.45E-03
CHROMIUM	3.33E-05	3.33E-06	3.26E-04	3.26E-05	7.69E-02	1.54E-02	**1.94E+00**	3.87E-01	5.71E-02	1.14E-02	2.00E-05	2.00E-06
COPPER	4.00E-02	3.04E-02	2.69E-01	2.05E-01	6.00E-03	4.57E-03	1.46E-01	1.11E-01	5.82E-03	4.43E-03	2.24E-02	1.70E-02
LEAD	1.10E-01	1.10E-02	**1.05E+00**	1.05E-01	6.65E-01	6.65E-02	**1.62E+01**	**1.62E+00**	5.57E-01	5.57E-02	7.54E-02	7.54E-03
MERCURY	1.83E-01	3.66E-02	6.59E-01	1.32E-01	3.41E-01	3.41E-02	**7.15E+00**	7.15E-01	7.09E-02	7.09E-03	1.36E-02	2.72E-03
SILVER	3.94E-03	3.94E-04	1.45E-01	1.45E-02	NA	NA	NA	NA	NA	NA	1.68E-03	1.68E-04
ZINC	2.20E-02	1.10E-02	2.16E-01	1.08E-01	1.04E-01	1.15E-02	**5.18E+00**	5.74E-01	1.90E-01	2.10E-02	1.65E-02	8.23E-03

NOAEL - no observed adverse effect level
LOAEL - lowest observed adverse effect level
HQ - hazard quotient
NA - not available

TABLE 10-14

NUMBER OF SAMPLE LOCATIONS EXCEEDING USEPA REGION 4 ECOLOGICAL SOIL SCREENING LEVELS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA

Chemicals of Potential Concern	Region 4 Surface Soil Screening Value	Total Number of Samples	Number of Samples Exceeding or Equal to Screening Value
Semivolatile Organics (ug/kg)			
1-METHYLNAPHTHALENE	---	8	NA
ACENAPHTHYLENE	---	27	NA
BENZO(A)ANTHRACENE	---	27	NA
BENZO(A)PYRENE	100	27	4
BENZO(B)FLUORANTHENE	---	27	NA
BENZO(G,H,I)PERYLENE	---	27	NA
BENZO(K)FLUORANTHENE	---	27	NA
BIS(2-ETHYLHEXYL)PHTHALATE	---	19	NA
CHRYSENE	---	27	NA
DIBENZO(A,H)ANTHRACENE	---	27	NA
FLUORANTHENE	100	27	2
INDENO(1,2,3-CD)PYRENE	---	27	NA
PYRENE	100	27	2
TOTAL PAHs	1000	27	2
Pesticides PCBs (ug/kg)			
4,4'-DDD	2.5	19	1
4,4'-DDE	2.5	19	8
4,4'-DDT	2.5	19	8
TOTAL DDT	2.5	19	8
DIELDRIN	0.5	19	7
ALPHA-CHLORDANE	---	19	NA
GAMMA-CHLORDANE	---	19	NA
AROCLOR-1254	20	19	2
AROCLOR-1260	20	19	1
TOTAL PCBs	20	19	3
Inorganics (mg/kg)			
ALUMINUM	50	19	19
ANTIMONY	3.5	19	1
ARSENIC	10	19	1
BARIUM	165	19	1
CADMIUM	1.6	19	3
CHROMIUM	0.4	19	19
COPPER	40	19	4
IRON	200	19	19
LEAD	50	19	8
MANGANESE	100	19	9
MERCURY	0.1	19	4
SILVER	2	19	3
VANADIUM	2	19	19
ZINC	50	19	6

NA - not applicable, no USEPA Region 4 screening level available.

TABLE 10-15

**SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
MAXIMUM CONCENTRATIONS WITH AND WITHOUT SAMPLE 16S007
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA**

Parameter	Frequency of Detection	Maximum Concentration With 16S007	Sample of Maximum Detection With 16S007	Maximum Concentration Without 16S007	Sample of Maximum Detection Without 16S007	Region 4 Eco SS Criteria	Maximum Hazard Quotient With 16S007	Maximum Hazard Quotient Without 16S007
Semivolatile Organics (ug/kg)								
1-METHYLNAPHTHALENE	1/8	41	16SO2401	41	16SO2401	---	NA	NA
ACENAPHTHYLENE	1/27	7	16SO2501	7	16SO2501	---	NA	NA
BENZO(A)ANTHRACENE	11/27	250 J	16S00701	185	16SO2601	---	NA	NA
BENZO(A)PYRENE	9/27	310 J	16S00701	217	16SO2601	100	**3.1**	**2.2**
BENZO(B)FLUORANTHENE	9/27	350 J	16S00701	300	16S00901	---	NA	NA
BENZO(G,H,I)PERYLENE	9/27	490	16S01201	490	16S01201	---	NA	NA
BENZO(K)FLUORANTHENE	6/27	340 J	16S00701	102	16SO2601	---	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	110 J	16S00701	78	16S01101	---	NA	NA
CHRYSENE	11/27	270 J	16S00701	59	16SO2601	---	NA	NA
DIBENZO(A,H)ANTHRACENE	1/27	110 J	16S00701	ND	ND	---	NA	NA
FLUORANTHENE	9/27	260 J	16S00701	169	16SO2601	100	**2.6**	**1.7**
INDENO(1,2,3-CD)PYRENE	11/27	240 J	16S00701	199	16SO2601	---	NA	NA
PYRENE	9/27	170 J	16S00701	150	16S00901	100	**1.7**	**1.5**
TOTAL PAHs		2838		1919		1000	**2.8**	**1.9**
Pesticides PCBs (ug/kg)								
4,4'-DDD	2/19	18 J	16S00701	2.1	16S01101	2.5	**7.2**	0.8
4,4'-DDE	8/19	53	16S00701	51	16S01101	2.5	**21.2**	**20.4**
4,4'-DDT	8/19	28	16S01101	28	16S01101	2.5	**11.2**	**11.2**
TOTAL DDT		99		81.1		2.5	**39.6**	**32.4**
DIELDRIN	7/19	60	16S01001-D	60	16S01001-D	0.5	**120**	**120**
ALPHA-CHLORDANE	3/19	12 J	16S01001-D	12J	16S01001-D	---	NA	NA
GAMMA-CHLORDANE	3/19	7.9 J	16S01001-D	7.9J	16S01001-D	---	NA	NA
AROCLOR-1254	2/19	130	16S00801	130J	16S00801	20	**6.5**	**6.5**
AROCLOR-1260	1/19	110 J	16S01001-D	110J	16S01001-D	20	**5.5**	**5.5**
TOTAL PCBs		240		240		20	**12**	**12**
Inorganics (mg/kg)								
ANTIMONY	1/19	5.9 J	16S00701	ND	ND	3.5	**1.69**	**ND**
ARSENIC	19/19	12.1	16S01101	12.1	16S01101	10	**1.21**	**1.2**
BARIUM	19/19	257	16S00701	92.5	16S01101	165	**1.56**	0.6
CADMIUM	16/19	7.6	16S00701	5.3	16S01101	1.6	**4.75**	**3.3**
CHROMIUM	19/19	29.2	16S00701	24.5	16S01101	0.4	**73**	**61.3**
COPPER	18/19	202	16S00701	139	16S01101	40	**5.05**	**3.5**
LEAD	19/19	759	16S00701	436	16S01101	50	**15.18**	**8.7**
MANGANESE	19/19	372	16S01401	372	16S01401	100	**3.72**	**3.7**
MERCURY	8/19	0.65 J	16S00701	0.2	16S01101	0.1	**6.5**	**2.0**
SILVER	5/19	7.1	16S00701	4.1	16S01001	2	**3.55**	**2.1**
VANADIUM	19/19	28.9	16-SL-02	28.9	16-SL-02	2	**14.45**	**14.5**
ZINC	19/19	773	16S00701	60.9	16S01101	50	**15.46**	**1.2**

ND - Not detected
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 10-16

HAZARD QUOTIENTS USING MEAN SURFACE SOIL CONCENTRATIONS WITHOUT SAMPLE 16S007
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
RISK ASSESSMENT RE-EVAUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
Ecological Contaminant of Concern	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**
Metals and Inorganic Compounds												
ARSENIC	1.76E-01	1.76E-02	**1.63E+00**	1.63E-01	7.77E-04	2.59E-04	1.81E-01	6.03E-02	3.05E-04	1.02E-04	5.71E-03	5.71E-04
CADMIUM	7.44E-03	7.44E-04	5.48E-01	5.48E-02	3.94E-04	2.85E-05	8.20E-01	5.95E-02	6.77E-04	4.91E-05	9.40E-04	9.40E-05
CHROMIUM	2.97E-05	2.97E-06	2.91E-04	2.91E-05	6.86E-03	1.37E-03	**1.73E+00**	3.45E-01	5.10E-03	1.02E-03	1.78E-06	1.78E-07
COPPER	2.62E-02	1.99E-02	1.77E-01	1.34E-01	3.94E-04	3.00E-04	9.56E-02	7.28E-02	3.82E-04	2.91E-04	1.47E-03	1.12E-03
LEAD	6.75E-02	6.75E-03	6.48E-01	6.48E-02	4.09E-02	4.09E-03	**9.95E+00**	9.95E-01	3.43E-02	3.43E-03	4.63E-03	4.63E-04
MERCURY	1.27E-01	2.53E-02	4.55E-01	9.10E-02	2.36E-02	2.36E-03	**4.94E+00**	4.94E-01	4.90E-03	4.90E-04	9.39E-04	1.88E-04
SILVER	2.92E-03	2.92E-04	1.08E-01	1.08E-02	NA	NA	NA	NA	NA	NA	1.25E-04	1.25E-05
ZINC	1.33E-02	6.63E-03	1.30E-01	6.51E-02	6.26E-03	6.93E-04	**3.12E+00**	3.45E-01	1.14E-02	1.26E-03	9.90E-04	4.95E-04

NOAEL - no observed adverse effect level
LOAEL - lowest observed adverse effect level
HQ - hazard quotient
NA - not available

TABLE 10-17

SELECTION OF CHEMICALS OF POTENTIAL CONCERN SURFACE SOIL COMPARISON TO BACKGROUND
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Mean Concentration	Sample of Maximum Detection	Region 4 Eco SS Criteria	Maximum Hazard Quotient	Site Greater Than Background?	COPC?
Semivolatile Organics (ug/kg)									
1-METHYLNAPHTHALENE	1/8	41	41	12.1	16SO2401	---	NA	NA	**Y**
ACENAPHTHYLENE	1/27	7	7	136	16SO2501	---	NA	NA	**Y**
BENZO(A)ANTHRACENE	11/27	3.2 J	250 J	137	16S00701	---	NA	NA	**Y**
BENZO(A)PYRENE	9/27	5.3 J	310 J	142	16S00701	100	3.1	NA	**Y**
BENZO(B)FLUORANTHENE	9/27	7 J	350 J	154	16S00701	---	NA	NA	**Y**
BENZO(G,H,I)PERYLENE	9/27	4.7 J	490	156	16S01201	---	NA	NA	**Y**
BENZO(K)FLUORANTHENE	6/27	7.7 J	340 J	142	16S00701	---	NA	NA	**Y**
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	43 J	110 J	143	16S00701	---	NA	NA	**Y**
CHRYSENE	11/27	4.4 J	270 J	133	16S00701	---	NA	NA	**Y**
DIBENZO(A,H)ANTHRACENE	1/27	110 J	110 J	132	16S00701	---	NA	NA	**Y**
FLUORANTHENE	9/27	11	260 J	138	16S00701	100	2.6	NA	**Y**
INDENO(1,2,3-CD)PYRENE	11/27	4.5 J	240 J	139	16S00701	---	NA	NA	**Y**
PYRENE	9/27	5.3 J	170 J	133	16S00701	100	1.7	NA	**Y**
TOTAL PAHs		254.1	2948	1697		1000	2.95	NA	**Y**
Pesticides PCBs (ug/kg)									
4,4'-DDD	2/19	2.1 J	18 J	4.07	16S00701	2.5	7.2	NA	**Y**
4,4'-DDE	8/19	2 J	53	10.5	16S00701	2.5	21.2	NA	**Y**
4,4'-DDT	8/19	2.7 J	28	6.64	16S01101	2.5	11.2	NA	**Y**
TOTAL DDT		6.8	99	21.24		2.5	39.6	NA	**Y**
DIELDRIN	7/19	2.5 J	60	8.64	16S01001-D	0.5	120	NA	**Y**
AROCLOR-1254	2/19	36 J	130	42.9	16S00801	20	6.5	NA	**Y**
AROCLOR-1260	1/19	48 J	110 J	39.1	16S01001-D	20	5.5	NA	**Y**
TOTAL PCBs		84	240	82.04		20	12	NA	**Y**
Inorganics (mg/kg)									
ALUMINUM	19/19	1780 J	18600	8768	16-SL-02	50	372	**N**	**N**
ANTIMONY	1/19	5.9 J	5.9 J	5.27	16S00701	3.5	1.69	**Y**	**Y**
ARSENIC	19/19	0.64 J	12.1	2.82	16S01101	10	1.21	**Y**	**N**
BARIUM	19/19	4 J	257	36.0	16S00701	165	1.56	**Y**	**Y**
CADMIUM	16/19	0.21 J	7.6	1.14	16S00701	1.6	4.75	**Y**	**Y**
CHROMIUM	19/19	3.2	29.2	10.5	16S00701	0.4	73	**Y**	**Y**
COPPER	18/19	2.9 J	202	30.5	16S00701	40	5.05	**Y**	**Y**
IRON	19/19	1310 J	48900	9184	16S01101	200	244.5	**Y**	**N**
LEAD	19/19	4.4 J	759	103	16S00701	50	15.18	**Y**	**Y**
MANGANESE	19/19	4.9	372	129	16S01401	100	3.72	**N**	**N**
MERCURY	8/19	0.05 J	0.65 J	0.101	16S00701	0.1	6.5	**Y**	**Y**
SILVER	5/19	0.87 J	7.1	1.46	16S00701	2	3.55	**N**	**N**
VANADIUM	19/19	3.2 J	28.9	15.8	16-SL-02	2	14.45	**N**	**N**
ZINC	19/19	3.4 J	773	101	16S00701	50	15.46	**Y**	**Y**

COPC - Chemical of Potential Concern
Eco SS - USEPA Region 4 ecological screening levels for soils

TABLE 10-18

SELECTION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
COMPARISON TO VARIOUS GUIDELINES
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

			ORNL SS Value				Beyer 1990				CCME		Dutch (2000)			
Parameter	Maximum	Mean[1]	Earthworm/ Micororganism[2]	Samples Above Guideline	Phytotoxicity	Samples Above Guideline	"A" Value	Samples Above Guideline	"B" Value	Samples Above Guideline	SQG	Samples Above Guideline	Target	Samples Above Guideline	Intervention	Samples Above Guideline
Semivolatile Organics (ug/kg)																
1-METHYLNAPHTHALENE	41	12.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	7	136	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	250	137	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	310	142	NA	NA	NA	NA	100	3 of 27	1000	0 of 27	700	0 of 27	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	350	154	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	490	156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	340	142	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BIS(2-ETHYLHEXYL)PHTHALATE	110	143	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100[3]	1 of 19	60000[3]	0 of 19
CHRYSENE	270	133	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	110	132	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	260	138	NA	NA	NA	NA	100	2 of 27	1000	0 of 27	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	240	139	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PYRENE	170	133	NA	NA	NA	NA	100	2 of 27	10000	0 of 27	NA	NA	NA	NA	NA	NA
TOTAL PAHs	2838	1555	NA	NA	NA	NA	1000	2 of 27	20000	0 of 27	NA	NA	1000	2 of 27	40000	0 of 27
Pesticides PCBs (ug/kg)																
4,4'-DDD	18	4.07	NA	NA	NA	NA	100[4]	0 of 19	500[4]	0 of 19	NA	NA	NA	NA	NA	NA
4,4'-DDE	53	10.5	NA	NA	NA	NA	100[4]	0 of 19	500[4]	0 of 19	NA	NA	NA	NA	NA	NA
4,4'-DDT	28	6.64	NA	NA	NA	NA	100[4]	0 of 19	500[4]	0 of 19	NA	NA	NA	NA	NA	NA
TOTAL DDT	99	21.24	NA	NA	NA	NA	100[4]	0 of 19	500[4]	0 of 19	700	0 of 19	10	7 of 19	4000	0 of 19
DIELDRIN	60	8.64	NA	NA	NA	NA	100[4]	0 of 19	500[4]	0 of 19	NA	NA	0.5	7 of 19	NA	NA
AROCLOR-1254	130	42.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1260	110	39.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBs	240	82.04	NA	NA	40000	0 of 19	50	1 of 19	1000	0 of 19	330	0 of 19	20	3 of 19	1000	0 of 19
Inorganics (mg/kg)																
ANTIMONY	5.9	5.27	600	0 of 19	5	1 of 19	NA	NA	NA	NA	NA	NA	3	1 of 19	15	0 of 19
ARSENIC	12.1	2.82	60	0 of 19	10	1 of 19	20	0 of 19	30	0 of 19	12	1 of 19	29	0 of 19	55	0 of 19
BARIUM	257	36.0	3000	0 of 19	500	0 of 19	200	1 of 19	400	0 of 19	500	0 of 19	160	1 of 19	625	0 of 19
CADMIUM	7.6	1.1	20	0 of 19	4	2 of 19	1	3 of 19	5	2 of 19	4	2 of 19	1	4 of 19	12	0 of 19
CHROMIUM	29.2	10.5	10	10 of 19	1[5]	19 of 19	100	0 of 19	250	0 of 19	64	0 of 19	100	0 of 19	380	0 of 19
COPPER	202	30.5	50	4 of 19	100	2 of 19	50	4 of 19	100	2 of 19	63	3 of 19	36	4 of 19	190	1 of 19
IRON	48900	9184	200	19 of 19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	759	103	500	1 of 19	50	8 of 19	50	8 of 19	150	3 of 19	140	3 of 19	85	5 of 19	530	1 of 19
MERCURY	0.65	0.101	0.1	4 of 19	0.3	1 of 19	0.5	1 of 19	2	0 of 19	6.6	0 of 19	0.3	1 of 19	10	0 of 19
ZINC	773	101	100	5 of 19	50	6 of 19	200	2 of 19	500	1 of 19	200	2 of 19	140	4 of 19	720	1 of 19

SQG - soil quality guideline
NA - Guideline not available
1 Means were calculated with all data substituting one-half the detection limit for results reported as non-detected .
2 Lowest number between earthworm and micororganism values.
3 Value for total phthalates.
4 Organochlorinated (each) value.
5 For hexavalent chromium.

TABLE 10-19

SUMMARY OF COPCS FOR ECOLOGICAL RISK ASSESSMENT OF SITE 16 SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Range of Detection			Location of Maximum Concentration	EPA Region 4 Screening Criteria	Maximum Hazard Quotient	Mean Hazard Quotient	# Samples Exceeding Criteria	Range of Detection Limits	Below Background Concentration?	Retained as COPC in Surface Soil?
		Minimum	Maximum	Mean[1]								
Volatile Organics (ug/kg)												
TOLUENE	1/19	1	1	5.11	16S00501	50	0.02	0.10	NA	6 - 13	NA[3]	No[acde]
TOTAL XYLENES	3/19	1	5	5.29	16-SL-01	50	0.10	0.11	NA	11 - 13	NA[3]	No[cde]
Semivolatile Organics (ug/kg)												
1-METHYLNAPHTHALENE	1/8	41	41	12.1	16SO2401	---	NA	NA	NA	10 - 24	NA[3]	No[ade]
ACENAPHTHYLENE	1/27	7	7	136	16SO2501	---	NA	NA	NA	7.1 - 420	NA[3]	No[a]
BENZO(A)ANTHRACENE	11/27	3.2	250	137	16S00701	---	NA	NA	NA	350 - 420	NA[3]	Yes[i]
BENZO(A)PYRENE	9/27	5.3	310	142	16S00701	100	3.1	1.42	4	7.1 - 420	NA[3]	Yes[g]
BENZO(B)FLUORANTHENE	9/27	7	350	154	16S00701	---	NA	NA	NA	12 - 420	NA[3]	Yes[i]
BENZO(G,H,I)PERYLENE	9/27	4.7	490	156	16S01201	---	NA	NA	NA	7.1 - 420	NA[3]	Yes[i]
BENZO(K)FLUORANTHENE	6/27	7.7	340	142	16S00701	---	NA	NA	NA	7.1 - 420	NA[3]	Yes[i]
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	43	110	143	16S00701	---	NA	NA	NA	350 - 420	NA[3]	No[f]
CHRYSENE	11/27	4.4	270	133	16S00701	---	NA	NA	NA	12 - 420	NA[3]	Yes[i]
DIBENZO(A,H)ANTHRACENE	1/27	110	110	132	16S00701	---	NA	NA	NA	7 - 420	NA[3]	No[a]
FLUORANTHENE	9/27	11	260	138	16S00701	100	2.6	1.38	2	12 - 420	NA[3]	Yes[g]
INDENO(1,2,3-CD)PYRENE	11/27	4.5	240	139	16S00701	---	NA	NA	NA	350 - 420	NA[3]	Yes[i]
NAPHTHALENE	1/27	27	27	137	16SO2501	100	0.3	1.37	NA	7.1 - 420	NA[3]	No[a]
PHENANTHRENE	6/27	4.6	52	132	16S00701	100	0.5	1.32	NA	7 - 420	NA[3]	Yes[i]
PYRENE	9/27	5.3	170	133	16S00701	100	2	1.33	2	12 - 420	NA[3]	Yes[g]
TOTAL PAHs		242.7	2917	1823		1000	2.9	1.82	2		NA[3]	Yes[g]
Pesticides PCBs (ug/kg)												
4,4'-DDD	2/19	2.1	18	4.07	16S00701	2.5	7	1.63	1	3.5 - 20	NA[3]	Yes[g]
4,4'-DDE	8/19	2	53	10.5	16S00701	2.5	21.2	4.21	8	3.6 - 18	NA[3]	Yes[g]
4,4'-DDT	8/19	2.7	28	6.64	16S01101	2.5	11.2	2.66	8	3.6 - 18	NA[3]	Yes[g]
TOTAL DDT		6.8	99	21.24		2.5	40	8.49	8		NA[3]	Yes[g]
DIELDRIN	7/19	2.5	60	8.64	16S01001-D	0.5	120.0	17.27	7	3.6 - 20	NA[3]	Yes[g]
ALPHA-CHLORDANE	3/19	1.6	12	8.97	16S01001-D	---	NA	NA	NA	1.8 - 99	NA[3]	Yes[i]
GAMMA-CHLORDANE	3/19	1	7.9	8.74	16S01001-D	---	NA	NA	NA	1.8 - 99	NA[3]	Yes[i]
AROCLOR-1254	2/19	36	130	42.9	16S00801	20	6.5	2.15	2	35 - 200	NA[3]	Yes[g]
AROCLOR-1260	1/19	48	110	39.1	16S01001-D	20	5.5	1.96	1	36 - 200	NA[3]	Yes[g]
TOTAL PCBs		84	240	82.04		20	12.0	4.10	3		NA[3]	Yes[g]
Inorganics (mg/kg)												
ALUMINUM	19/19	1780	18600	8768	16-SL-02	50	372.00	175.35	19	---	Y	No[be]
ANTIMONY	1/19	5.9	5.9	5.27	16S00701	3.5	1.69	1.51	1	2.7 - 12	N	No[a]
ARSENIC	19/19	0.64	12.1	2.82	16S01101	10	1.21	0.28	1	---	N	No[b]
BARIUM	19/19	4	257	36.0	16S00701	165	1.56	0.22	1	---	N	Yes[g]
BERYLLIUM	14/19	0.06	0.23	0.209	16S01201	1.1	0.21	0.19	NA	1	NA[4]	No[c]
CADMIUM	16/19	0.21	7.6	1.14	16S00701	1.6	4.8	0.71	3	0.61 - 1	Y	No[b]
CALCIUM	19/19	70.8	2350	572	16S00701	---	NA	NA	NA	---	NA[4]	No[j]
CHROMIUM	19/19	3.2	29.2	10.5	16S00701	0.4[2]	73	25.00	19	---	N	No[gh]
COBALT	10/19	0.69	4.1	3.25	16S00701	20	0.205	0.16	NA	10	NA[4]	No[c]
COPPER	18/19	2.9	202	30.5	16S00701	40	5.05	0.76	4	5	N	Yes[g]
IRON	19/19	1310	48900	9184	16S01101	200	244.50	45.92	19	---	N	No[e]
LEAD	19/19	4.4	759	103	16S00701	50	15.18	2.07	8	---	N	Yes[gh]
MAGNESIUM	19/19	29.9	443	157	16S00701	---	NA	NA	NA	---	NA[4]	No[j]
MANGANESE	19/19	4.9	372	129	16S01401	100	3.72	1.29	9	---	Y	No[b]
MERCURY	8/19	0.05	0.65	0.101	16S00701	0.1	6.50	1.01	4	0.08 - 0.1	N	Yes[gh]
NICKEL	10/19	1.9	26	5.48	16S01101	30	0.87	0.18	NA	2.4 - 8	NA[4]	No[c]
POTASSIUM	6/19	69.7	230	336	16-SL-03	---	NA	NA	NA	133 - 1000	NA[4]	No[j]
SELENIUM	7/19	0.13	0.2	0.332	16S01501	0.81	0.25	0.41	NA	0.41 - 1	NA[4]	No[c]
SILVER	5/19	0.87	7.1	1.46	16S00701	2	3.55	0.73	3	0.33 - 2	Y	No[b]
SODIUM	17/19	114	361	205	16S00701	---	NA	NA	NA	1000	NA[4]	No[j]
THALLIUM	2/19	0.13	0.18	0.791	16S00301	1	0.18	0.79	NA	0.46 - 2	NA[4]	No[c]
VANADIUM	19/19	3.2	28.9	15.8	16-SL-02	2	14.45	7.91	19	---	Y	No[b]
ZINC	19/19	3.4	773	101	16S00701	50	15.46	2.03	6	---	N	Yes[gh]
Miscellaneous Parameter (mg/kg)												
CYANIDE	7/19	0.1	0.51	0.211	16S01501	0.9	0.57	0.23	NA	0.24 - 0.5	NA[4]	No[c]

COPC = Contaminant of potential concern.
Hazard quotient = chemical concentration ÷ USEPA Region 4 criteria
NA = Not available
1 Means were calculated using one-half the detection limit for results reported as non-detected.
2 Criteria for hexavalent chromium.
3 Not analyzed for in backgound data set.
4 Not analyzed in background data due to absence of site risk.
a Infrequent detection.
b Site concentrations are less than background concentrations.
c Maximum concentration is less than USEPA Region 4 screening level.
d This chemical does not biomagnify in the food chain.
e Anticipated low bioavailability.
f Possible laboratory contaminant.
g Potential risk to terrestrial receptors via direct contact.
h Potential risk to terrestrial receptors via the food chain.
i No USEPA Region 4 screening level available.
j Nutrient.

11.0 SITE 17, CRASH CREW TRAINING AREA A

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 17. The assessment updates a risk evaluation presented in the 2000 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

11.1 SITE DESCRIPTION

Site 17 is approximately 4 acres in size and is located along the northwestern facility boundary, near the North Air Field taxiway. The site was used as an aircraft crash crew training area between 1951 and 1991 and is composed of seven burn pits (shallow depressions approximately 1 to 2 feet deep) rimmed by mounded earth. Each of the burn pits contained decommissioned fuel tanks or aircraft fuselage to simulate aircraft crashes. Crash crew training activities consisted of pouring approximately 100 gallons of AVGAS or jet fuel into the depressions and igniting it. As part of the training exercises, the fires were then extinguished using aqueous film-forming foam (AFFF).

The approximate location of Site 17 is shown on Figure 1-2 of the 2000 RI report. There are currently no buildings at Site 17. No permanent surface water sources exist at Site 17.

The 1992/1993 Phase IIA field investigation soil samples were collected from drainage ditches or swales suspected of channeling overland flow occurring during heavy rains from the seven burn pit areas. In the 1992/1993 Phase IIA field investigation, the suspected burn pit areas and drainage ditches were well defined. In 1994, fuel tanks and aircraft bodies used in training activities were removed from the burn pits, and earth-moving equipment spread the rim of mounded soil from around the burn pit depressions to the adjacent areas.

As part of the February 1999 IRA, contaminated areas of the site were covered with 2 feet of soil, and sod was placed over the soil cover. Currently, the site is maintained as an open, grassy field with a slight surface gradient sloping gently towards the southwest.

11.2 SUMMARY OF PHASE IIA/IIB AND REMOVAL ACTION FIELD INVESTIGATIONS

The surface soil dataset for Site 17 consists of surface soil samples collected from 34 locations (17-SL-01 through 17-SL-34) during the 1992 Phase IIA field investigation. The sample locations were biased based on the locations of the seven burn pit areas, stained areas, and areas of overland flow associated with the crash crew training activities or high organic vapor analyzer (OVA) readings. Surface soil samples were collected from a depth interval of 0 to 8 inches bgs and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, cyanide, and TRPH.

The subsurface soil dataset for Site 17 consists of 19 samples collected from nine soil borings (17-SB-01 through 17-SB-09) advanced during the 1993 Phase IIA field investigation. Most of the subsurface soil samples were collected from depth intervals of 5 to 7 feet, 10 to 12 feet, 15 to 17 feet or 20 to 22 feet and analyzed for TCL VOCs, SVOCs, pesticides and PCBs, TAL inorganics, and cyanide. One soil sample (17SB1-60-62) from location 17-SB-01 was collected from a depth interval of 60 to 62 feet and analyzed for TAL inorganics and cyanide only

Eight surface soil samples were selected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs and metals.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 11-1 and 11-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Surface and subsurface soil sample locations are presented on Figures 3-1 and 3-2 of the 2000 RI report.

11.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 17. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 11-1 and 11-2, respectively.

11.3.1 Surface Soil

Seven VOCs, four SVOCs, 20 inorganics, and TRPH were detected in 34 surface soil samples collected at Site 17. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 11-1. The following chemicals were detected in surface soils at maximum concentrations exceeding the direct contact, risk based COPC screening levels and were retained as COPCs for surface soil at Site 17:

- Total xylenes
- Naphthalene
- Inorganics (antimony, barium, cadmium, chromium, and copper)
- TPRH

Concentrations of antimony, cadmium, and chromium exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned PRGs and SCTLs. Concentrations of naphthalene and xylenes exceeded the simple apportioned PRGs but were less than the non-apportioned PRGs and apportioned and non-apportioned SCTLs. Concentrations of barium and copper exceeded the simple apportioned and non-apportioned SCTLs but were less than the non-apportioned and simple apportioned PRGs. The maximum TRPH concentration exceeded the simple apportioned and non-apportioned SCTLs.

Although concentrations of aluminum, arsenic, iron, manganese, and vanadium in surface soil exceeded the screening criteria (Table 11-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to surface soil at the Site 17. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 17 surface soils.

11.3.2 <u>Subsurface Soil</u>

Three VOCs, two SVOCs, two pesticides, 22 inorganics, and cyanide were detected in 15 shallow subsurface soil samples (2 feet to 15 feet bgs) collected at Site 17. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 11-2. The following chemicals were detected in subsurface soil samples at maximum concentrations exceeding the direct contact risk based COPC screening levels and were retained as COPCs for subsurface soil at Site 17:

- Inorganics (antimony and chromium)

Concentrations of antimony and chromium exceeded the simple apportioned PRGs but were less than non-apportioned PRGs and apportioned and non-apportioned SCTLs.

Although concentrations of aluminum, arsenic, iron, manganese and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 17. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, manganese, and vanadium are not considered COPCs for Site 17 subsurface soils.

11.4 RISK CHARACTERIZATION

This section provides a characterization of the human health risks associated with potential exposures to chemicals in surface and subsurface soils at Site 17. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user) using USEPA and proposed FDEP guidance. The results of the risk characterization are discussed below.

11.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 17 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 11.3. Potential cancer risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 11-3. The results are discussed below. Chemical-specific risks for Site 17 are presented in Appendix B.

Non-carcinogenic Risk

Cumulative HIs estimated for exposures to surface and subsurface soil by all receptors were less than or equal to 1, indicating adverse, non-carcinogenic effects are not anticipated for these receptors under the conditions defined by the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to surface and subsurface soil for all receptors were within USEPA's target risk range of 1×10^{-4} to 1×10^{-6}. However, the ILCR estimated for construction worker exposure to chromium in subsurface soils exceeded the State of Florida's target risk level of 1×10^{-6}. The chemical-specific ILCR for chromium was 2×10^{-6}.

11.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 17 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 11-4 through 11-9 and are discussed below.

11.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 11-4 presents a comparison of the maximum detected concentrations and EPCs for surface soil to FDEP residential SCTLs. The following chemicals were identified as exceeding the Level 1 SCTLs and background concentrations, and were retained as potential COCs for residential exposures to surface soil at Site 17:

- Inorganics (barium and copper)
- TRPH

The maximum detections reported for arsenic, iron, and vanadium also exceeded the Level 1 criteria, and the maximum detected concentrations of arsenic and vanadium exceeded three times the residential SCTLs. However, please see preceding discussions regarding the metals (Section 11.3.1). Arsenic, iron, and vanadium were not retained as COCs for residential exposures to surface soil at the Site 17.

As shown in Table 11-5, the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified three potential COCs; therefore, a Level 2 evaluation was conducted. A comparison of the maximum detected concentrations and EPCs for chemicals detected in surface soil to FDEP industrial SCTLs is presented in Table 11-6. TRPH was the only contaminant exceeding its Level 2 SCTL and was retained as a COC for industrial exposures to surface soil at Site 17.

Arsenic concentrations also exceeded the Level 2 criteria. However, please see preceding discussions regarding arsenic (Section 11.3.1). Arsenic was not retained as a COC for industrial exposures to surface soil at the Site 17.

Level 3 Evaluation (Recreational)

The results of the Level 2 evaluation identified TRPH as a potential COC; therefore, a Level 3 evaluation was conducted. Alternative CTLs for recreational exposures were derived following the methodology presented in Section 2. A comparison of the maximum detected concentrations and EPCs for chemicals detected in surface soil to the alternative CTLs is presented in Table 11-7. Arsenic was the only chemical exceeding the Level 3 CTL. However, as noted above, please see preceding discussions regarding arsenic (Section 11.3.1). Arsenic was not retained as a COC for recreational exposures to surface soil at the Site 17.

11.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 11-8 presents a comparison of the maximum detected concentrations and EPCs for chemicals detected in subsurface soil to FDEP residential SCTLs. The maximum detections for all chemicals were less than Level 1 SCTLs with the exception of arsenic, iron, and vanadium. The maximum detected concentrations of arsenic, iron, and vanadium also exceeded three times the residential SCTL. However, please see preceding discussions regarding these metals (Section 11.3.2). No chemicals were retained as COCs for residential exposures to surface soil at Site 17.

As shown in Table 11-9, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 (Industrial) and Level 3 (Recreational) Evaluations

No potential COCs were identified in the Level 1 evaluation for subsurface soil; consequently, Level 2 and Level 3 evaluations were not required.

11.5 UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the final risk numbers, is provided in this section.

11.5.1 Uncertainty Associated with TRPH

Although TRPH was identified as a COPC in surface soil, potential risks from exposures to TRPH in surface soil were not evaluated in this risk assessment because no toxicity criteria are available for TRPH. However, the FDEP has derived SCTLs for TRPH using methodology developed by MADEP.

FDEP SCTLs were used to estimate potential risks following the methodology presented in Section 2. The resulting HIs are presented in the following table:

Receptor	TRPH Concentration (mg/kg)	FDEP SCTL or CTL (mg/kg)	Hazard Index
Resident	4957	340	15
Industrial Worker	4957	2500	2
Construction Worker	4957	490	10
Maintenance Worker	4957	21000	0.2
Adolescent Recreational User	4957	31000	0.2
Adult Recreational User	4957	40000	0.1

HIs for residents, industrial workers, and construction workers exceeded 1. HIs for maintenance workers, adolescent recreational users, and adult recreational users were less than 1 indicating adverse, non-carcinogenic effects are not anticipated for these receptors under the conditions defined in the exposure assessment.

11.5.2 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for Site 17 were selected using available background concentrations for soil. Aluminum, arsenic, iron, manganese, and vanadium in surface soil and subsurface soil were eliminated as COPCs, in part, on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	29,900	55,200	72,000
Arsenic	5.9	8	0.8
Iron	23,800	89,800	23,000
Manganese	198	226	1,600
Vanadium	71.3	105	15

The SCTLs presented for aluminum, iron, manganese, and vanadium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately two-fifths of the SCTL, and the maximum detected concentration in subsurface soil is approximately three-fourths of the SCTL. The maximum detected concentration of iron in surface soil marginally exceeds the SCTL, and the maximum detected concentration is subsurface soil is approximately four times the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse, non-cancer health effects. The maximum detected concentration of manganese in surface soil is approximately one-eighth of the SCTL, and the maximum detected concentration of manganese in subsurface soil is approximately one-seventh of the SCTL. The maximum detected concentration of vanadium in surface soil is approximately 4.7 times greater than its SCTL, and the maximum detected concentration in subsurface soil is approximately 7 times greater than the SCTL. The residential SCTL for vanadium is based on acute exposures to soil by a child (the "pica" soil exposure scenario); as a point of comparison, a residential SCTL based on chronic exposures is 510 mg/kg.

The SCTL presented for arsenic is based on the potential for cancer effects and represents the 1×10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1×10^{-5} and 1×10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1×10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1×10^{-6} cancer risk levels but not the 1×10^{-5} and 1×10^{-4} risk levels.

11.5.3 Evaluation of Deep Subsurface Soils

A risk assessment evaluation of chemical concentrations detected in relatively shallow subsurface soils (i.e., soils between 2 feet and 15 feet bgs) for Site 17 was presented in Sections 11.3.2 and 11.4.2.2. The risk assessment evaluation of chemical concentrations in soil samples collected from greater than 15 feet bgs is presented in Tables 11-10 through 11-12. No chemicals were selected as COPCs using USEPA methodology or potential COCs using FDEP methodology.

11.5.4 Evaluation of the Potential of VOC Migration to Indoor Air

VOCs were not selected as COPCs for surface or subsurface soil samples collected at Sites 9 through 16 or at Site 18. However, total xylenes were selected as COPCs for Site 17. While there are currently no buildings at Site 17 and no current plans to construct a building at this site, an evaluation of the potential for the VOC migration from soils to the indoor air of a hypothetical building is a consideration in this risk assessment. Ideally, this evaluation would be conducted using soil gas data. However, soil gas data for total xylenes is not available for Site 17 and a review of the data (Appendix Table A-9-1) suggests VOCs contamination is sporadic only (i.e., not plume-like or indicative of wide-spread contamination). This significantly limits the potential for the migration of the VOCs from soils to the indoor air of a hypothetical building.

11.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in 34 surface soil and 15 subsurface soil samples collected at Site 17. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 17. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of Site 17 in 1999 (Bechtel, March 2000). Consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying this permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction activities or an excavation bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Two organics (total xylenes, naphthalene), five inorganics (antimony, barium, cadmium, chromium, and copper), and TRPH were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. Antimony and chromium were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) developed for the resident, industrial worker, and construction worker exposed to TRPH in surface soils exceed 1 indicating a potential for non-carcinogenic health effects. However, the HIs developed for all other COPCs in surface or subsurface soil did not exceed 1. With the exception of the cancer risk estimates for the construction worker exposed to chromium in subsurface soils, none of the cancer risk estimates developed for the COPCs exceeded the State of Florida cancer risk benchmark of 1×10^{-6}; none of the risk estimates exceeded the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. As indicated below, chromium was not selected as a potential COC based on the comparison of maximum concentrations or EPCs to FDEP SCTLs for residential or industrial land use.

The risk assessment conducted using the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using the published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of EPCs to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
Barium	TRPH	None
Copper		
TRPH		

The maximum concentrations of barium (168 mg/kg) and copper (235 mg/kg) exceed acute SCTLs. However, these metals were detected in two or three locations only at concentrations exceeding the acute SCTLs. The EPC for TRPH (4,960 mg/kg) is an order of magnitude greater than the current residential SCTL (340 mg/kg).

No chemicals were identified as potential COCs for subsurface soils based on a comparison of maximum detected concentrations or EPCs to SCTLs.

TABLE 11-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 PRGs Residential (6)		Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
78-93-3	2-BUTANONE	3/34	0.006 J	0.08 J	0.011 - 15	17-SL-14	0.08	NA (13)	7300	N	730	N	3100	16000	Developmental	1000	2.6E-05	No	BSL
75-15-0	CARBON DISULFIDE	14/34	0.001 J	0.026 J	0.005 - 7.3	17-SL-14	0.026	NA	360	N	36	N	200	270	Developmental, Neurological	40	1.3E-04	No	BSL
100-41-4	ETHYLBENZENE	6/34	0.002 J	14 J	0.005 - 0.74	17-SL-19	14	NA	400	sat	400	N	1100	1500	Developmental, Kidney, Liver	370	1.3E-02	No	BSL
75-09-2	METHYLENE CHLORIDE	2/34	0.069 J	0.13 J	0.007 - 7.3	17-SL-16	0.13	NA	9.1	C	1.5	C	16	17	---	3	8.1E-03	No	BSL
108-88-3	TOLUENE	4/34	0.001 J	23 J	0.005 - 7.3	17-SL-19	23	NA	520	sat	520	N	380	7500	Kidney, Liver, Neurological	76	6.1E-02	No	BSL
1330-20-7	**TOTAL XYLENES**	20/34	0.001 J	130 J	0.006 - 0.73	17-SL-19	130	NA	270	N	**27**	N	5900	130	Body Weight, Mortality, Neurological	1200	2.2E-02	**Yes**	**ASL**
79-01-6	TRICHLOROETHENE	2/34	0.002 J	0.16 J	0.005 - 7.3	17-SL-02	0.16	NA	2.8	C	0.47	C	6	6.4	---	1	2.7E-02	No	BSL
	Semivolatile Organics (mg/kg)																		
91-57-6	2-METHYLNAPHTHALENE	5/34	0.19 J	4.9	0.36 - 9.9	17-SL-23	4.9	NA	56	N	5.6	N	80	210	Body Weight, Nasal	16	6.1E-02	No	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/34	0.049 J	0.75 J	0.36 - 9.9	17-SL-19	0.75	NA	35	C	5.8	C	76	72	---	15	9.9E-03	No	BSL
85-68-7	BUTYL BENZYL PHTHALATE	3/34	0.36 J	0.49	0.36 - 9.9	17-SL-03	0.49	NA	12000	N	1200	N	15000	17000	Liver	5000	3.3E-05	No	BSL
91-20-3	**NAPHTHALENE**	6/34	0.081 J	7.2	0.36 - 9.9	17-SL-14	7.2	NA	56	N	**5.6**	N	40	55	Body Weight, Nasal	8	1.8E-01	**Yes**	**ASL**
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	34/34	4500	29900	---	17-SL-10	29900	no	76000	N	**7600**	N	72000	80000	Body Weight	**14400**	4.2E-01	No	BKG
7440-36-0	**ANTIMONY**	3/34	3.1 J	10.3 J	2.7 - 3.2	17-SL-31	10.3	yes	31	N	**3.1**	N	26	27	Blood, Mortality	**8.7**	4.0E-01	**Yes**	**ASL**
7440-38-2	ARSENIC	33/34	0.29 J	5.9	1.5 - 1.6	17-SL-19	5.9	no	0.39	C	**0.07**	C	0.8	2.1	---	**0.16**	**7.4E+00**	No	BKG
7440-39-3	**BARIUM**	34/34	3.6 J	168	---	17-SL-21-D	168	yes	5400	N	540	N	110	120	Cardiovascular	**110**	1.5E+00	**Yes**	**ASL**
7440-41-7	BERYLLIUM	25/34	0.06 J	0.22 J	0.05 - 0.06	17-SL-19	0.22	NE (14)	150	N	15	N	120	120	Gastrointestinal, Respiratory	40	1.8E-03	No	BSL
7440-43-9	**CADMIUM**	15/34	0.76 J	30.6 J	0.59 - 0.7	17-SL-21-D	30.6	yes	37	N	**3.7**	N	75	82	Kidney	75	4.1E-01	**Yes**	**ASL**
7440-70-2	CALCIUM	32/34	94.9 J	780 J	312 - 520	17-SL-26	780	NE	---		---		---	---	---	---	---	No	NUT
7440-47-3	**CHROMIUM**	34/34	4	82.1	---	17-SL-29	82.1	yes	210	C	**35**	C	210	210	---	**42**	3.9E-01	**Yes**	**ASL**
7440-48-4	COBALT	30/34	0.59 J	2.4 J	0.37 - 4.7	17-SL-01	2.4	NE	900	C	150	N	4700	1700	Cardiovascular, Immunological, Neurological, Reproductive	940	5.1E-04	No	BSL
7440-50-8	**COPPER**	34/34	2.4 J	235 J	---	17-SL-21-D	235	yes	3100	N	310	N	110	150	Gastrointestinal	**110**	2.1E+00	**Yes**	**ASL**
7439-89-6	IRON	34/34	2550	23800	---	17-SL-07	23800	no	23000	N	**2300**	N	23000	53000	Blood, Gastrointestinal	**7670**	1.0E+00	No	BKG
7439-92-1	LEAD	34/34	3	207	---	17-SL-16	207	NE	400		400		400	400	---	400	5.2E-01	No	BSL
7439-95-4	MAGNESIUM	34/34	59.1 J	520 J	---	17-SL-21-D	520	NE	---		---		---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	34/34	5.1	198	---	17-SL-01	198	no	1800	N	**180**	N	1600	3500	Neurological	320	1.2E-01	No	BKG
7440-02-0	NICKEL	23/34	2.7 J	14.7	2.3 - 2.8	17-SL-11-D	14.7	NE	1600	N	160	N	110	340	Body Weight	110	1.3E-01	No	BSL
7440-09-7	POTASSIUM	25/34	153 J	1350	131 - 155	17-SL-23	1350	NE	---		---		---	---	---	---	---	No	NUT
7440-22-4	SILVER	6/34	0.44 J	0.61 J	0.32 - 0.38	17-SL-17-D	0.61	NE	390	N	39	N	390	410	Skin	390	1.6E-03	No	BSL
7440-23-5	SODIUM	32/34	133 J	279 J	187 - 211	17-SL-07	279	NE	---		---		---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	34/34	6.4 J	71.3	---	17-SL-07	71.3	no	550	N	**55**	N	15	67	NOEL	**15**	**4.8E+00**	No	BKG
7440-66-6	ZINC	34/34	7.2 J	179	---	17-SL-16	179	NE	23000	N	2300	N	23000	26000	Blood	7670	7.8E-03	No	BSL
	Petroleum Hydrocarbons (mg/kg)																		
TTNUS001	**TRPH**	18/21	2.3	19300	1.8 - 2	17-SL-06	19300	NA	---		---	N	340	460	Multiple endpoints	**170**	**5.7E+01**	**Yes**	**ASL**

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 11-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 6 chemicals detected in surface soil at Site 17 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 6. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 5 carcinogens were detected in surface soil at Site 17. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 5. For noncarcinogens, neurological effects were identified as the target organ for 5 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 5. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

17-SL-01	17-SL-11	17-SL-18	17-SL-26
17-SL-02	17-SL-11-D	17-SL-19	17-SL-27
17-SL-03	17-SL-12	17-SL-20	17-SL-28
17-SL-04	17-SL-13	17-SL-21	17-SL-29
17-SL-05	17-SL-14	17-SL-21-D	17-SL-30
17-SL-06	17-SL-15	17-SL-22	17-SL-31
17-SL-07	17-SL-16	17-SL-23	17-SL-32
17-SL-08	17-SL-17	17-SL-24	17-SL-33
17-SL-09	17-SL-17-D	17-SL-25	17-SL-34
17-SL-10			

TABLE 11-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
78-93-3	2-BUTANONE	2/15	0.018 J	0.034	0.011 - 0.012	17SB6-5-7	0.034	NA (13)	7300 N	730	3100 N	16000	Developmental	3,100	1.1E-05	No	BSL
108-10-1	4-METHYL-2-PENTANONE	1/15	0.004 J	0.004 J	0.011 - 0.012	17SB6-5-7	0.004	NA	790 N	79	220 N	4300	Kidney, Liver	73	1.8E-05	No	BSL
67-64-1	ACETONE	8/15	0.011 J	0.13 J	0.012 - 0.12	17SB9-10-12	0.13	NA	1600 N	160	780 N	11000	Kidney, Liver, Neurological	130	1.7E-04	No	BSL
	Semivolatile Organics (mg/kg)																
84-74-2	DI-N-BUTYL PHTHALATE	1/15	0.31	0.31	0.35 - 0.4	17SB8-10-12	0.31	NA	6100 N	610	7300 N	8200	Mortality	3,700	4.2E-05	No	BSL
84-66-2	DIETHYL PHTHALATE	1/15	0.094 J	0.094 J	0.35 - 0.4	17SB4-10-12	0.094	NA	49000 N	4900	54000 N	61000	Body Weight	14,000	1.7E-06	No	BSL
	Pesticides PCBs (mg/kg)																
72-55-9	4,4'-DDE	1/15	0.0065 J	0.0065 J	0.0035 - 0.004	17SB6-5-7	0.0065	NA	1.7 C	0.34	3.3 C	2.9	---	0.80	2.0E-03	No	BSL
50-29-3	4,4'-DDT	1/15	0.019	0.019	0.0035 - 0.004	17SB6-5-7	0.019	NA	1.7 C	0.34	3.3 C	2.9	---	0.80	5.8E-03	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	15/15	3730	55200	---	17SB2-5-7	55200	no	76000 N	**7600**	72000 N	80000	Body Weight	**18,000**	7.7E-01	No	BKG
7440-36-0	**ANTIMONY**	2/14	7 J	8 J	2.6 - 6	17SB7-5-7	8	yes	31 N	**3.1**	26 N	27	Blood, Mortality	8.7	3.1E-01	**Yes**	**ASL**
7440-38-2	ARSENIC	15/15	0.5 J	8	---	17SB1-5-7	8	no	0.39 C	**0.08**	0.8 C	2.1	---	**0.2**	**1.0E+01**	No	BKG
7440-39-3	BARIUM	15/15	1.5 J	14.3 J	---	17SB1-5-7	14.3	NE (14)	5400 N	540	110 N	120	Cardiovascular	110	1.3E-01	No	BSL
7440-41-7	BERYLLIUM	4/15	0.13 J	0.45 J	0.06 - 0.37	17SB2-5-7	0.45	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	3.8E-03	No	BSL
7440-43-9	CADMIUM	2/15	0.75 J	2.5	0.26 - 0.99	17SB6-5-7	2.5	NE	37 N	3.7	75 N	82	Kidney	75	3.3E-02	No	BSL
7440-70-2	CALCIUM	10/15	16.9 J	159 J	7.2 - 31.8	17SB5-10-12	159	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	**CHROMIUM**	15/15	4.8	50.5	---	17SB6-5-7	50.5	yes	210 C	**42**	210 C	210	---	53	2.4E-01	**Yes**	**ASL**
7440-48-4	COBALT	9/15	0.57 J	4.4 J	0.5 - 1.4	17SB8-5-7	4.4	NE	900 C	180	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	783	9.4E-04	No	BSL
7440-50-8	COPPER	13/15	1.4 J	22.7	0.39	17SB6-5-7	22.7	NE	3100 N	310	110 N	150	Gastrointestinal	110	2.1E-01	No	BSL
7439-89-6	IRON	15/15	6240	89800	---	17SB6-5-7	89800	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7,670**	**3.9E+00**	No	BKG
7439-92-1	LEAD	15/15	0.92	44.7	---	17SB1-5-7	44.7	NE	400	400	400	400	---	400	1.1E-01	No	BSL
7439-95-4	MAGNESIUM	14/15	18.3 J	187 J	22.4 - 64.5	17SB8-5-7	187	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	15/15	12.4	226	---	17SB6-5-7	226	no	1800 N	**180**	1600 N	3500	Neurological	267	1.4E-01	No	BKG
7439-97-6	MERCURY	6/15	0.02 J	0.04 J	0.02 - 0.03	17SB6-5-7	0.04	NE	23 N	2.3	3.4 N	3	Neurological	0.57	1.2E-02	No	BSL
7440-02-0	NICKEL	6/15	3.1 J	6.9 J	1.6 - 3	17SB8-5-7	6.9	NE	1600 N	160	110 N	340	Body Weight	110	6.3E-02	No	BSL
7440-09-7	POTASSIUM	7/15	53.6 J	1180	40.9 - 121	17SB1-5-7	1180	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	9/15	0.59 J	4.5	0.11 - 0.5	17SB2-10-12	4.5	NE	390 N	39	390 N	440	Hair Loss, Neurological, Skin	65	1.2E-02	No	BSL
7440-22-4	SILVER	10/15	0.69 J	1.9 J	0.45 - 0.53	17SB5-5-7-D	1.9	NE	390 N	39	390 N	410	Skin	195	4.9E-03	No	BSL
7440-23-5	SODIUM	10/15	16.4 J	207 J	12.2 - 33.4	17SB4-5-7	207	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	15/15	15.7	105	---	17SB6-5-7	105	no	550 N	**55**	15 N	67	NOEL	**15**	**7.0E+00**	No	BKG
7440-66-6	ZINC	13/15	1.6 J	18.9	0.37 - 2.9	17SB6-5-7	18.9	NE	23000 N	2300	23000 N	26000	Blood	7,670	8.2E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	9/15	0.45 J	0.66 J	0.16 - 0.62	17SB7-5-7	0.66	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	2.2E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 11-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 5 chemicals detected in subsurface soil at Site 17 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 5. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 4 carcinogens were detected in subsurface soil at Site 17. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 4. For noncarcinogens, neurological effects were identified as the target organ for 6 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 6. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

17SB1-5-7	17SB5-5-7-D
17SB2-10-12	17SB6-10-12
17SB2-5-7	17SB6-5-7
17SB3-10-12	17SB7-5-7
17SB4-10-12	17SB8-10-12
17SB4-5-7	17SB8-5-7
17SB5-10-12	17SB9-10-12
17SB5-5-7	17SB9-5-7

TABLE 11-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 17, CRASH CREW TRAINING AREA A
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks > 10^{-4}	Chemicals with Cancer Risks > 10^{-5} and ≤ 10^{-4}	Chemicals with Cancer Risks > 10^{-6} and ≤ 10^{-5}	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	9E-08	- -	- -	- -	0.3	- -
	Subsurface Soil	1E-07	- -	- -	- -	0.3	- -
Industrial Workers	Surface Soil	6E-08	- -	- -	- -	0.02	- -
	Subsurface Soil	1E-07	- -	- -	- -	0.02	- -
Construction Workers	Surface Soil	1E-06	- -	- -	- -	0.3	- -
	Subsurface Soil	2E-06	- -	- -	Chromium	0.2	- -
Maintenance Workers	Surface Soil	7E-09	- -	- -	- -	0.004	- -
Adolescent Recreational Users	Surface Soil	2E-09	- -	- -	- -	0.008	- -
Adult Recreational Users	Surface Soil	3E-09	- -	- -	- -	0.005	- -
Lifelong Recreational Users	Surface Soil	4E-09	- -	- -	- -	NA	- -

Notes:
NA - Not applicable.
HI - Hazard Index.

TABLE 11-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.08 J	0.08	3100	N	2.6E-05	NA (6)	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.026 J	0.026	200	N	1.3E-04	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	14 J	1	1100	N	1.3E-02	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.13 J	0.13	16	C	8.1E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	23 J	2	380	N	6.1E-02	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	130 J	13	5900	N	2.2E-02	NA	No	maximum < SCTL
79-01-6	TRICHLOROETHENE	0.16 J	0.16	6	C	2.7E-02	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	4.9	1	80	N	6.1E-02	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.75 J	0.75	76	C	9.9E-03	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.49	0.49	15000	N	3.3E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	7.2	1	40	N	1.8E-01	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	29900	15900	72000	N	4.2E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	10.3 J	2.3	26	N	4.0E-01	yes	No	maximum < SCTL
7440-38-2	ARSENIC	5.9	2.8	0.8	C	**7.4E+00**	no	No	(8)
7440-39-3	**BARIUM**	168	38.1	110	N	**1.5E+00**	yes	**Yes**	maximum > SCTL
7440-41-7	BERYLLIUM	0.22 J	0.11	120	N	1.8E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	30.6 J	3.9	75	N	4.1E-01	yes	No	maximum < SCTL
7440-70-2	CALCIUM	780 J	309	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	82.1	25.8	210	C	3.9E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	1.5	4700	N	5.1E-04	NE	No	maximum < SCTL
7440-50-8	**COPPER**	235 J	49	110	N	**2.1E+00**	yes	**Yes**	maximum > SCTL
7439-89-6	IRON	23800	9550	23000	N	**1.0E+00**	no	No	(8)
7439-92-1	LEAD	207	46.2	400		5.2E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	520 J	218	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	198	82.3	1600	N	1.2E-01	no	No	maximum < SCTL
7440-02-0	NICKEL	14.7	4	110	N	1.3E-01	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1350	423	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.61 J	0.25	390	N	1.6E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	279 J	198	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	71.3	25.2	15	N	**4.8E+00**	no	No	(8)
7440-66-6	ZINC	179	50.9	23000	N	7.8E-03	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	**TRPH**	19300	4960	340	N	**5.7E+01**	NA	**Yes**	maximum > SCTL

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

<u>Footnotes</u>:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 17 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

<u>Associated Samples:</u>

17-SL-01	17-SL-11	17-SL-18	17-SL-26
17-SL-02	17-SL-11-D	17-SL-19	17-SL-27
17-SL-03	17-SL-12	17-SL-20	17-SL-28
17-SL-04	17-SL-13	17-SL-21	17-SL-29
17-SL-05	17-SL-14	17-SL-21-D	17-SL-30
17-SL-06	17-SL-15	17-SL-22	17-SL-31
17-SL-07	17-SL-16	17-SL-23	17-SL-32
17-SL-08	17-SL-17	17-SL-24	17-SL-33
17-SL-09	17-SL-17-D	17-SL-25	17-SL-34
17-SL-10			

<u>Definitions</u>:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 11-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT OF SOILS RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)		Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	3/34	0.08	J	0.08	17-SL-14	NA (5)	25000
75-15-0	CARBON DISULFIDE	14/34	0.026	J	0.026	17-SL-14	NA	730
100-41-4	ETHYLBENZENE	6/34	14	J	1	17-SL-19	NA	400
75-09-2	METHYLENE CHLORIDE	2/34	0.13	J	0.13	17-SL-16	NA	2400
108-88-3	TOLUENE	4/34	23	J	2	17-SL-19	NA	650
1330-20-7	TOTAL XYLENES	20/34	130	J	13	17-SL-19	NA	140
79-01-6	TRICHLOROETHENE	2/34	0.16	J	0.16	17-SL-02	NA	1300
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	5/34	4.9		1	17-SL-23	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	7/34	0.75	J	0.75	17-SL-19	NA	31000
85-68-7	BUTYL BENZYL PHTHALATE	3/34	0.49		0.49	17-SL-03	NA	890
91-20-3	NAPHTHALENE	6/34	7.2		1	17-SL-14	NA	220
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	TRPH	18/21	19300		4960	17-SL-06	NA	---

<u>Footnotes</u>:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:				
	17-SL-08	17-SL-15	17-SL-21-D	17-SL-29
17-SL-01	17-SL-09	17-SL-16	17-SL-22	17-SL-30
17-SL-02	17-SL-10	17-SL-17	17-SL-23	17-SL-31
17-SL-03	17-SL-11	17-SL-17-D	17-SL-24	17-SL-32
17-SL-04	17-SL-11-D	17-SL-18	17-SL-25	17-SL-33
17-SL-05	17-SL-12	17-SL-19	17-SL-26	17-SL-34
17-SL-06	17-SL-13	17-SL-20	17-SL-27	
17-SL-07	17-SL-14	17-SL-21	17-SL-28	

TABLE 11-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.08 J	0.08	21000 N	3.8E-06	NA (6)	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.026 J	0.026	1400 N	1.9E-05	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	14 J	1	8400 N	1.7E-03	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.13 J	0.13	23 C	5.7E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	23 J	2	2600 N	8.8E-03	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	130 J	13	40000 N	3.3E-03	NA	No	maximum < SCTL
79-01-6	TRICHLOROETHENE	0.16 J	0.16	8.5 C	1.9E-02	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	4.9	1	560 N	8.8E-03	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.75 J	0.75	280 C	2.7E-03	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.49	0.49	320000 N	1.5E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	7.2	1	270 N	2.7E-02	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	29900	15900	--- N	---	no	No	maximum < SCTL
7440-36-0	ANTIMONY	10.3 J	2.3	240 N	4.3E-02	yes	No	maximum < SCTL
7440-38-2	ARSENIC	5.9	2.8	3.7 C	**1.6E+00**	no	No	(8)
7440-39-3	BARIUM	168	38.1	87000 N	1.9E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.22 J	0.11	800 N	2.8E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	30.6 J	3.9	1300 N	2.4E-02	yes	No	maximum < SCTL
7440-70-2	CALCIUM	780 J	309	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	82.1	25.8	420 C	2.0E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	1.5	110000 N	2.2E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	235 J	49	76000 N	3.1E-03	yes	No	maximum < SCTL
7439-89-6	IRON	23800	9550	480000 N	5.0E-02	no	No	maximum < SCTL
7439-92-1	LEAD	207	46.2	920	2.3E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	520 J	218	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	198	82.3	22000 N	9.0E-03	no	No	maximum < SCTL
7440-02-0	NICKEL	14.7	4	28000 N	5.3E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1350	423	---	---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.61 J	0.25	9100 N	6.7E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	279 J	198	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	71.3	25.2	7400 N	9.6E-03	no	No	maximum < SCTL
7440-66-6	ZINC	179	50.9	560000 N	3.2E-04	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	**TRPH**	19300	4960	2500 N	**7.7E+00**	NA	**Yes**	maximum > SCTL

TABLE 11-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 17 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

17-SL-01	17-SL-11	17-SL-18	17-SL-26
17-SL-02	17-SL-11-D	17-SL-19	17-SL-27
17-SL-03	17-SL-12	17-SL-20	17-SL-28
17-SL-04	17-SL-13	17-SL-21	17-SL-29
17-SL-05	17-SL-14	17-SL-21-D	17-SL-30
17-SL-06	17-SL-15	17-SL-22	17-SL-31
17-SL-07	17-SL-16	17-SL-23	17-SL-32
17-SL-08	17-SL-17	17-SL-24	17-SL-33
17-SL-09	17-SL-17-D	17-SL-25	17-SL-34
17-SL-10			

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 11-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.08 J	0.08	750000	N	1.1E-07	NA (6)	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.026 J	0.026	21000	N	1.2E-06	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	14 J	1	100000	N	1.4E-04	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.13 J	0.13	290	C	4.5E-04	NA	No	maximum < SCTL
108-88-3	TOLUENE	23 J	2	40000	N	5.8E-04	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	130 J	13	19000	N	6.8E-03	NA	No	maximum < SCTL
79-01-6	TRICHLOROETHENE	0.16 J	0.16	120	C	1.3E-03	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	4.9	1	12000	N	4.1E-04	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.75 J	0.75	480	C	1.6E-03	NA	No	maximum < SCTL
85-68-7	BUTYL BENZYL PHTHALATE	0.49	0.49	370000	N	1.3E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	7.2	1	4400	N	1.6E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	29900	15900	---	N	---	no	No	(8)
7440-36-0	ANTIMONY	10.3 J	2.3	1500	N	6.9E-03	yes	No	maximum < SCTL
7440-38-2	ARSENIC	5.9	2.8	6.2	C	9.5E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	168	38.1	250000	N	6.7E-04	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.22 J	0.11	7200	N	3.1E-05	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	30.6 J	3.9	1300	N	2.4E-02	yes	No	maximum < SCTL
7440-70-2	CALCIUM	780 J	309	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	82.1	25.8	5900	C	1.4E-02	yes	No	maximum < SCTL
7440-48-4	COBALT	2.4 J	1.5	25000	N	9.6E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	235 J	49	150000	N	1.6E-03	yes	No	maximum < SCTL
7439-89-6	IRON	23800	9550	1100000	N	2.2E-02	no	No	maximum < SCTL
7439-92-1	LEAD	207	46.2	1900		1.1E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	520 J	218	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	198	82.3	69000	N	2.9E-03	no	No	maximum < SCTL
7440-02-0	NICKEL	14.7	4	73000	N	2.0E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1350	423	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.61 J	0.25	18000	N	3.4E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	279 J	198	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	71.3	25.2	3600	N	2.0E-02	no	No	maximum < SCTL
7440-66-6	ZINC	179	50.9	1100000	N	1.6E-04	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	19300	4960	31000	N	6.2E-01	NA	No	maximum < SCTL

TABLE 11-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 SCTLs for recreational users were developed using the methods presented in Chapter 62-777, F.A.C., August 1999 and the most current toxicological data available in IRIS. The recreational users are assumed to b exposed 45 days per year by ingestion, inhalation, and dermal contact. Calculations of the recreational SCTLs are presented in Appendix C.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 17 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

17-SL-01	17-SL-11	17-SL-18	17-SL-26
17-SL-02	17-SL-11-D	17-SL-19	17-SL-27
17-SL-03	17-SL-12	17-SL-20	17-SL-28
17-SL-04	17-SL-13	17-SL-21	17-SL-29
17-SL-05	17-SL-14	17-SL-21-D	17-SL-30
17-SL-06	17-SL-15	17-SL-22	17-SL-31
17-SL-07	17-SL-16	17-SL-23	17-SL-32
17-SL-08	17-SL-17	17-SL-24	17-SL-33
17-SL-09	17-SL-17-D	17-SL-25	17-SL-34
17-SL-10			

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 11-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.034	0.01	3100 N	3.2E-06	NA (6)	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.004 J	0.004	220 N	1.8E-05	NA	No	maximum < SCTL
67-64-1	ACETONE	0.13 J	0.08	780 N	1.0E-04	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
84-74-2	DI-N-BUTYL PHTHALATE	0.31	0.2	7300 N	2.7E-05	NA	No	maximum < SCTL
84-66-2	DIETHYL PHTHALATE	0.094 J	0.094	54000 N	1.7E-06	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-55-9	4,4'-DDE	0.0065 J	0.003	3.3 C	9.1E-04	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.019	0.005	3.3 C	1.5E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	55200	38800	72000 N	5.4E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	8 J	3.8	26 N	1.5E-01	yes	No	maximum < SCTL
7440-38-2	ARSENIC	8	5.2	0.8 C	6.5E+00	no	No	(8)
7440-39-3	BARIUM	14.3 J	8	110 N	1.3E-01	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.45 J	0.16	120 N	1.3E-03	NE	No	maximum < SCTL
7440-43-9	CADMIUM	2.5	0.78	75 N	3.3E-02	NE	No	maximum < SCTL
7440-70-2	CALCIUM	159 J	85.7	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	50.5	41.2	210 C	2.0E-01	yes	No	maximum < SCTL
7440-48-4	COBALT	4.4 J	2.2	4700 N	4.7E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	22.7	7.8	110 N	2.1E-01	NE	No	maximum < SCTL
7439-89-6	IRON	89800	47200	23000 N	2.1E+00	no	No	(8)
7439-92-1	LEAD	44.7	7.72	400	1.9E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	187 J	142	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	226	73.3	1600 N	4.6E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.04 J	0.023	3.4 N	6.8E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	6.9 J	3.7	110 N	6.3E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1180	553	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	4.5	1.9	390 N	4.9E-03	NE	No	maximum < SCTL
7440-22-4	SILVER	1.9 J	0.98	390 N	2.5E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	207 J	110	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	105	91	15 N	7.0E+00	no	No	(8)
7440-66-6	ZINC	18.9	6.4	23000 N	2.8E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	0.66 J	0.44	30 N	2.2E-02	NA	No	maximum < SCTL

TABLE 11-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 17 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

17SB1-5-7	17SB5-5-7-D
17SB2-10-12	17SB6-10-12
17SB2-5-7	17SB6-5-7
17SB3-10-12	17SB7-5-7
17SB4-10-12	17SB8-10-12
17SB4-5-7	17SB8-5-7
17SB5-10-12	17SB9-10-12
17SB5-5-7	17SB9-5-7

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 11-9

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	2/15	0.034	0.01	17SB6-5-7	NA (5)	25000
108-10-1	4-METHYL-2-PENTANONE	1/15	0.004 J	0.004	17SB6-5-7	NA	3600
67-64-1	ACETONE	8/15	0.13 J	0.08	17SB9-10-12	NA	100000
	Semivolatile Organics (mg/kg)						
84-74-2	DI-N-BUTYL PHTHALATE	1/15	0.31	0.2	17SB8-10-12	NA	110
84-66-2	DIETHYL PHTHALATE	1/15	0.094 J	0.094	17SB4-10-12	NA	2000
	Pesticides PCBs (mg/kg)						
72-55-9	4,4'-DDE	1/15	0.0065 J	0.003	17SB6-5-7	NA	---
50-29-3	4,4'-DDT	1/15	0.019	0.005	17SB6-5-7	NA	---

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

17SB1-5-7	17SB4-10-12	17SB5-5-7-D	17SB8-10-12
17SB2-10-12	17SB4-5-7	17SB6-10-12	17SB8-5-7
17SB2-5-7	17SB5-10-12	17SB6-5-7	17SB9-10-12
17SB3-10-12	17SB5-5-7	17SB7-5-7	17SB9-5-7

TABLE 11-10

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL>15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)		Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)		Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																		
67-64-1	ACETONE	2/3	0.014 J	0.029 J	0.01	17SB1-15-17	0.029	NA	1600	N	160	780	N	11000	Kidney, Liver, Neurological	160	3.7E-05	No	BSL
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	4/4	347	24600	---	17SB1-15-17	24600	no	76000	N	7600	72000	N	80000	Body Weight	36,000	3.4E-01	No	BKG
7440-38-2	ARSENIC	3/4	0.43 J	5.5	0.15	17SB1-15-17	5.5	no	0.39	C	0.20	0.8	C	2.1	---	0.4	6.9E+00	No	BKG
7440-39-3	BARIUM	3/4	0.32 J	5.8 J	0.1	17SB1-15-17	5.8	NE (14)	5400	N	540	110	N	120	Cardiovascular	110	5.3E-02	No	BSL
7440-41-7	BERYLLIUM	1/4	0.15 J	0.15 J	0.06 - 0.11	17SB1-15-17	0.15	NE	150	N	15	120	N	120	Gastrointestinal, Respiratory	40	1.3E-03	No	BSL
7440-70-2	CALCIUM	4/4	7.6 J	70.3 J	---	17SB1-60-62	70.3	NE	---		---	---		---	---	---	---	No	NUT
7440-47-3	CHROMIUM	4/4	1.2 J	15.9	---	17SB1-15-17	15.9	yes	210	C	105	210	C	210	---	105	7.6E-02	No	BSL
7440-50-8	COPPER	3/4	1.1 J	4.3 J	0.34	17SB1-15-17	4.3	NE	3100	N	310	110	N	150	Gastrointestinal	110	3.9E-02	No	BSL
7439-89-6	IRON	4/4	457	13200	---	17SB1-15-17	13200	no	23000	N	2300	23000	N	53000	Blood, Gastrointestinal	7,670	5.7E-01	No	BKG
7439-92-1	LEAD	4/4	0.18 J	3.4	---	17SB1-15-17	3.4	NE	400		400	400		400	---	400	8.5E-03	No	BSL
7439-95-4	MAGNESIUM	3/4	9.4 J	96.4 J	7.3	17SB1-15-17	96.4	NE	---		---	---		---	---	---	---	No	NUT
7439-96-5	MANGANESE	4/4	1.5 J	15.1	---	17SB1-15-17	15.1	no	1800	N	180	1600	N	3500	Neurological	320	9.4E-03	No	BSL,BKG
7439-97-6	MERCURY	1/4	0.04 J	0.04 J	0.02	17SB1-60-62	0.04	NE	23	N	2.3	3.4	N	3	Neurological	0.68	1.2E-02	No	BSL
7440-02-0	NICKEL	1/4	2.8 J	2.8 J	1.7 - 2.6	17SB1-15-17	2.8	NE	1600	N	160	110	N	340	Body Weight	110	2.5E-02	No	BSL
7782-49-2	SELENIUM	2/4	0.91 J	1.5	0.11 - 0.44	17SB1-15-17	1.5	NE	390	N	39	390	N	440	Hair Loss, Neurological, Skin	78	3.8E-03	No	BSL
7440-23-5	SODIUM	1/4	169 J	169 J	11.4 - 12.2	17SB1-60-62	169	NE	---		---	---		---	---	---	---	No	NUT
7440-62-2	VANADIUM	4/4	1.6 J	36.4	---	17SB1-15-17	36.4	no	550	N	55	15	N	67	NOEL	15	2.4E+00	No	BKG
7440-66-6	ZINC	4/4	0.52 J	3.8 J	---	17SB1-60-62	3.8	NE	23000	N	2300	23000	N	26000	Blood	11,500	1.7E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																		
57-12-5	CYANIDE	3/4	0.43 J	0.52 J	0.16	17SB1-15-17	0.52	NA	1200	N	120	30	N	34	Body Weight, Neurological, Thyroid	30	1.7E-02	No	BSL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 2 chemicals detected in subsurface soil at Site 17 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 2. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 2 carcinogens were detected in subsurface soil at Site 17. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 2. For noncarcinogens, neurological effects were identified as the target organ for 5 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 5. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:
17SB1-15-17
17SB1-60-62
17SB5-20-22
17SB7-15-17

TABLE 11-11

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL>15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
67-64-1	ACETONE	0.029 J	0.029	780	N	3.7E-05	NA (6)	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	24600	24600	72000	N	3.4E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	5.5	5.5	0.8	C	6.9E+00	no	No	(8)
7440-39-3	BARIUM	5.8 J	5.8	110	N	5.3E-02	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.15 J	0.15	120	N	1.3E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	70.3 J	70.3	---		---		No	Essential Nutrient
7440-47-3	CHROMIUM	15.9	15.9	210	C	7.6E-02	NE	No	maximum < SCTL
7440-50-8	COPPER	4.3 J	4.3	110	N	3.9E-02	NE	No	maximum < SCTL
7439-89-6	IRON	13200	13200	23000	N	5.7E-01	no	No	maximum < SCTL
7439-92-1	LEAD	3.4	3.4	400		8.5E-03	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	96.4 J	96.4	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	15.1	15.1	1600	N	9.4E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.04 J	0.04	3.4	N	1.2E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	2.8 J	2.8	110	N	2.5E-02	NE	No	maximum < SCTL
7782-49-2	SELENIUM	1.5	1.5	390	N	3.8E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	169 J	169	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	36.4	36.4	15	N	2.4E+00	no	No	(8)
7440-66-6	ZINC	3.8 J	3.8	23000	N	1.7E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.52 J	0.52	30	N	1.7E-02	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 17 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

Associated Samples:
17SB1-15-17
17SB1-60-62
17SB5-20-22
17SB7-15-17

TABLE 11-12

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL>15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
67-64-1	ACETONE	2/3	0.014 J	0.029	17SB1-15-17	NA (5)	100000

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:
17SB1-15-17
17SB1-60-62
17SB5-20-22
17SB7-15-17

12.0 SITE 18, CRASH CREW TRAINING AREA B

This section presents the results of the HHRA conducted for surface and subsurface soil samples collected at Site 18. The assessment updates a risk evaluation presented in the 1999 RI report prepared for the Navy by HLA and was conducted per methodology recommended in USEPA and proposed State of Florida regulations and guidelines. The HHRA focuses on an evaluation of direct contact risk; an evaluation of the potential for chemical migration from soils to groundwater will be presented in the RI for Site 40 (the Basewide Groundwater Investigation).

12.1 SITE DESCRIPTION

Site 18 is approximately 5 acres in size and is located along the unimproved road on the northwestern facility boundary near the North Air Field taxiway. Site 18 was used for the training of firefighting crews between 1951 and 1991. Site 18 consists of 11 burn pits (shallow depressions approximately 1 to 2 feet deep) rimmed by mounded earth. Each of the burn pits contained decommissioned fuel tanks or aircraft fuselage to simulate aircraft crashes. Firefighting training activities consisted of pouring approximately 110 gallons of jet propellant (JP-5) fuel into the burn pit and igniting it. As part of the training exercises, the fires were then extinguished using AFFF. According to facility records, 6,285 gallons of fuel and 3,148 gallons of AFFF were used during 1984 alone.

The approximate location of Site 18 is shown on Figure 1-2 of the 1999 RI report. No permanent surface water sources exist at Site 18.

The 1992/1993 Phase IIA field investigation soil samples were collected from drainage ditches or swales suspected of channeling overland flow occurring during heavy rains from the 11 burn pit areas. In the 1992/1993 Phase IIA field investigation, the suspected burn pit areas and drainage ditches were well defined. In 1994, fuel tanks and aircraft bodies used in training activities were removed from the burn pits, and earth-moving equipment spread the rim of mounded soil from around the burn pit depressions to the adjacent areas.

Currently, the site is maintained as an open, grassy field with a slight surface gradient sloping gently towards the southwest. There are currently no buildings at Site 18. A 24 inch permeable soil layer and native grass cover was emplaced over the surface soil at Site 18 in 1999 (Bechtel, 2000).

12.2 SUMMARY OF PHASE IIA/IIB FIELD INVESTIGATION OF SOILS

The surface soil dataset for Site 18 consists of soil samples collected from 47 sample locations (18-SL-01 through 18-SL-47) during the 1992 Phase IIA field investigation. The sample locations were biased based on the location of the 11 burn pit areas, stained areas, and areas of overland flow associated with the former firefighting training activities or high OVA readings. Based on OVA readings, surface soil samples were collected from various depth intervals (up to 12 inches bgs) and analyzed for TCL VOCs and SVOCs, TAL inorganics, cyanide, and TRPH. Select surface soil samples were also analyzed for TCL pesticides and PCBs.

The subsurface soil dataset for Site 18 consists of 24 soil samples collected from 10 soil borings (18-SB-01, 18-SB-02, 18-SB-04, 18-SB-06, 18-SB-07, 18-SB-09, 18-SB-10, 18-SB-62, WHF-18-SB-6, WHF-18-SB-8) advanced during the 1993 Phase IIA field investigation. Subsurface soil samples were collected from depth intervals of 5 to 7 feet, 10 to 12 feet, 15 to 17 feet, 20 to 22 feet, 25 to 27 feet, 35 to 37 feet, or 40 to 42 feet and analyzed for TCL VOCs, SVOCs, pesticides, PCBs, TAL inorganics, cyanide, and TRPH. Twelve surface soil samples were also selected and analyzed for TCLP VOCs and metals.

Descriptive statistics (i.e., frequency of detection, range of positive detections, range of non-detect results) for the target analytes detected in the surface and subsurface soil samples are presented in Tables 12-1 and 12-2, respectively. The complete analytical database is included on the CD submitted with this report; a printout of the analytical database is provided in Appendix A.

Surface and subsurface soil sample locations are presented on Figures 3-1 and 3-2 of the 1999 RI report.

12.3 SELECTION OF COPCS FOR HUMAN HEALTH RISK ASSESSMENT

The direct contact, risk-based screening levels defined in Section 2 were used to select COPCs for Site 18. A discussion of the chemicals selected as COPCs (i.e., those chemicals detected at concentrations in excess of USEPA and FDEP direct contact exposure criteria) and the rationale for COPC selection are provided in the following paragraphs. COPC selection tables for surface soil and subsurface soil are presented as Tables 12-1 and 12-2, respectively.

12.3.1 <u>Surface Soil</u>

Seven VOCs, 15 SVOCs (including several cPAHs), 22 inorganics, and TRPH were detected in 47 surface soil samples collected at Site 18. A comparison of the maximum detected surface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 12-1. Also presented in Table 12-1 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in surface soil at maximum concentrations exceeding the direct contact, risk based COPC screening levels and background, and were retained as COPCs for surface soil at Site 18:

- SVOCs (2-methylnaphthalene, naphthalene, and carcinogenic PAHs)
- Inorganics (barium, cadmium, chromium, and copper)
- TPRH

cPAHs were detected in 1 of 47 surface soil samples at concentrations in excess of the simple apportioned and non-apportioned PRGs and SCTLs. Concentrations of 2-methylnaphthalene exceeded the simple apportioned PRG and SCTL but were less than the non-apportioned PRG and SCTL. Concentrations of naphthalene exceeded the simple apportioned PRG but were less than the non-apportioned PRG and simple apportioned and non-apportioned SCTLs. The maximum barium concentration exceeded the simple and non-apportioned SCTLs. Concentrations of cadmium exceeded the apportioned and non-apportioned PRGs but were less than the apportioned and non-apportioned SCTLs. Concentrations of copper exceeded the apportioned PRG and apportioned and non-apportioned SCTLs, but were less than the non-apportioned PRG. TRPH concentrations exceeded the apportioned and non-apportioned SCTLs.

Although concentrations of aluminum, arsenic, iron, and manganese in surface soil exceeded the screening criteria (Table 12-1) these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field sites. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix “Inorganics in Soil at NAS Whiting Field”, presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and manganese are not considered COPCs for Site 18 surface soils.

Antimony and thallium were not selected as COPCs based on the site data-to-background data comparisons presented in Appendix A.

12.3.2 Subsurface Soil

Four VOCs, eight SVOCs, one pesticide, 19 inorganics, TRPH, and cyanide were detected in 13 shallow subsurface soil samples collected at Site 18. A comparison of the maximum detected subsurface soil concentrations to screening levels based on USEPA Region 9 PRGs and FDEP SCTLs for residential exposures is presented in Table 12-2. Also presented in Table 12-2 are the results of the site data-to-background data comparisons conducted as described in Appendix A. The following chemicals were detected in subsurface soil at maximum concentrations exceeding the direct contact, risk based COPC screening levels and background and were retained as COPCs for subsurface soil at Site 18:

- SVOCs (2-methylnaphthalene and naphthalene)
- TPRH

Concentrations of 2-methylnaphthalene and naphthalene exceeded the simple apportioned PRGs and SCTLs but were less than the non-apportioned and PRGs and SCTLs. The maximum TRPH concentration exceeded the apportioned and non-apportioned SCTLs.

Although concentrations of aluminum, arsenic, iron, and vanadium in the subsurface soils exceeded the screening criteria these inorganics are not known to be associated with past practices or processes at any NAS Whiting Field Sites. Therefore, these inorganics were not retained as COPCs for direct contact exposures to subsurface soil at the Site 18. Additionally, the site-specific values for these inorganics are within the range of levels found at NAS Whiting Field and/or of naturally occurring levels throughout the southeastern United States. The Remedial Investigation (RI) for NAS Whiting Field Site 40, Basewide Groundwater, contains the appendix "Inorganics in Soil at NAS Whiting Field", presenting the technical basis for this determination. Considering the information presented above, aluminum, arsenic, iron, and vanadium are not considered COPCs for Site 18 subsurface soils.

12.4 RISK CHARACTERIZATION

This section provides a characterization of the human health risks associated with potential exposures to chemicals in surface and subsurface soils at Site 18. As discussed in Section 2, potential risks were estimated for five receptors (the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user) using USEPA and proposed FDEP guidance. The results of the risk characterization are discussed below.

12.4.1 Risk Characterization Using USEPA Guidelines

This section contains a summary of the results of the risk characterization for Site 18 conducted according to USEPA guidance. Quantitative risk estimates for potential human receptors were developed for those chemicals identified as COPCs in Section 12.3. Potential cancer risks and HIs were calculated using the methodology presented in Section 2 and are summarized in Table 12-3. The results are discussed below. Chemical-specific risks for Site 18 are presented in Appendix B.

Non-carcinogenic Risk

Cumulative HIs estimated for exposures to surface and subsurface soil by all receptors were less than or equal to 1, indicating adverse, non-carcinogenic effects are not anticipated for these receptors under the conditions defined in the exposure assessment.

Carcinogenic Risk

Cumulative ILCRs for exposures to surface and subsurface soil were less than or within USEPA's target risk range of 1×10^{-4} to 1×10^{-6} for all receptors. However, ILCRs estimated for surface soil for hypothetical future exposure incurred by a resident or industrial worker exceeded the State of Florida's target risk level of 1×10^{-6}. Only the chemical-specific risk estimates for cPAHs exceeded 1×10^{-6}.

12.4.2 Risk Characterization Using State of Florida Guidelines

This section contains a summary of the results of the risk characterization for Site 18 conducted according to proposed Florida Rule 62-780 FAC as discussed in Section 2. The results are summarized in Tables 12-4 through 12-11 and are discussed below.

12.4.2.1 Surface Soil

Level 1 Evaluation (Residential)

Table 12-4 presents a comparison of the maximum detected concentrations and EPCs for surface soil to the FDEP residential SCTLs. The following chemicals were identified as exceeding the Level 1 SCTLs and were retained as potential COCs for residential exposures to surface soil at Site 18:

- cPAHs (expressed as benzo(a)pyrene equivalents)
- Inorganics (barium, copper)
- TRPH

The maximum detected concentrations of cPAHs, copper, and TRPH were greater than three times the residential SCTLs.

The maximum concentrations and EPCs for arsenic and iron also exceeded the Level 1 criteria, and the maximum detected concentration of arsenic exceeded three times the residential SCTL. However, please see preceding discussions regarding arsenic and iron (Section 12.3.1). Arsenic and iron were not retained as COCs for residential exposures to surface soil at the Site 18.

As shown in Table 12-5, the concentrations of all organics in surface soil were significantly less than C_{sat} concentrations, indicating free product is not present in surface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified several COCs; therefore, a Level 2 evaluation was conducted. A comparison of the maximum detected concentrations and EPCs for surface soil to FDEP industrial SCTLs is presented in Table 12-6. The following chemicals were identified as exceeding Level 2 SCTLs and were retained as potential COCs for industrial exposures to surface soil at Site 18:

- cPAHs (expressed as benzo(a)pyrene equivalents)
- TRPH

The maximum detected concentration of TRPH exceeded the three times the industrial SCTL.

Level 3 Evaluation (Recreational)

The results of the Level 2 evaluation identified cPAHs and TRPH as potential COCs, therefore, a Level 3 evaluation was conducted. Alternative CTLs for recreational exposures were derived following the methodology presented in Section 2. A comparison of the maximum detected concentrations and EPCs for surface soil to the alternative CTLs is presented in Table 12-7. The cPAHs were the only chemicals with maximum concentrations and EPCs exceeding the Level 3 alternative CTLs and were retained as potential COCs for recreational exposures to surface soil at Site 18.

12.4.2.2 Subsurface Soil

Level 1 Evaluation (Residential)

Table 12-8 presents a comparison of the maximum detected concentrations and EPCs for subsurface soil to FDEP residential SCTLs. TRPH was the only chemical identified as exceeding the Level 1 SCTLs and was therefore retained as a potential COC for residential exposures to subsurface soil at Site 18. The maximum detected TRPH concentrations exceeded three times the residential SCTL.

The maximum detections and EPCs for arsenic and vanadium also exceeded the Level 1 criteria, and the maximum detected concentration of arsenic exceeded three times the residential SCTL. However, please see preceding discussions regarding arsenic and vanadium (Section 12.3.2). Therefore, arsenic and vanadium were not retained as potential COCs for residential exposures to subsurface soil at the Site 18.

As shown in Table 12-9, the concentrations of all organics in subsurface soil were significantly less than C_{sat} concentrations, indicating free product is not present in subsurface soil.

Level 2 Evaluation (Industrial)

The results of the Level 1 evaluation identified TRPH as a COC; therefore, a Level 2 evaluation was conducted. A comparison of the maximum detected concentrations and EPCs for subsurface soil to the FDEP industrial SCTLs is presented in Table 12-10. TRPH was the only chemical identified as exceeding the Level 2 SCTLs and was therefore retained as a potential COC for industrial exposures to subsurface soil at Site 18.

Level 3 Evaluation (Recreational)

The results of the Level 2 evaluation identified TRPH as a COC; therefore, a Level 3 evaluation was conducted. Alternative CTLs for recreational exposures were derived following the methodology presented in Section 2. A comparison of the maximum detected concentrations and EPCs for subsurface soil to the alternative CTLs is presented in Table 12-11. The maximum detected concentrations and EPCs for all chemicals were less than the Level 3 CLTs. Therefore, no chemicals were retained as COCs for recreational exposures to subsurface soil at the Site 18.

12.5 UNCERTAINTY ANALYSIS

A summary of the uncertainties associated with the baseline HHRA, including a discussion of how they may affect the final risk numbers, is provided in this section.

12.5.1 Uncertainty Associated with TRPH

Although TRPH was identified as a COPC in surface and subsurface soil, potential risks from exposures to TRPH in surface and subsurface soil were not evaluated in this risk assessment because no toxicity criteria are available for TRPH. However, FDEP has derived SCTLs for TRPH using methodology developed by MADEP. The SCTLs were used to estimate potential risks following the methodology presented in Section 2. The resulting HIs are presented in the tables below.

SURFACE SOIL			
Receptor	**TRPH Concentration (mg/kg)**	**FDEP SCTL or CTL (mg/kg)**	**Hazard Index**
Resident	6,770	340	20
Industrial Worker	6,770	2,500	3
Construction Worker	6,770	490	14
Maintenance Worker	6,770	21,000	0.3
Adolescent Recreational User	6,770	31,000	0.2
Adult Recreational User	6,770	40,000	0.2

HIs for all residents, industrial workers, and construction workers exposed to surface soil exceeded 1. HIs for maintenance workers, adolescent recreational users, and adult recreational users exposed to surface soil were less than 1 indicating adverse, non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions.

SUBSURFACE SOIL			
Receptor	**TRPH Concentration (mg/kg)**	**FDEP SCTL or CTL (mg/kg)**	**Hazard Index**
Residents	3,742	340	11
Industrial Worker	3,742	2,500	1
Construction Worker	3,742	490	8

HIs for residents and construction workers exceeded 1. The HI for the industrial workers was approximately equal to 1 indicating adverse, non-carcinogenic effects are not anticipated for industrial workers under the defined exposure conditions.

12.5.2 Qualitative Risk Evaluation of Metals Eliminated as COPCs Based on Background

COPCs for the Site 18 were selected using available background concentrations for soil. Aluminum, antimony, arsenic, iron, manganese, and thallium in surface soil and aluminum, arsenic, and iron in subsurface soil were eliminated as COPCs primarily on the basis of background concentrations. The following table provides a qualitative risk evaluation of these metals by comparing the maximum detected concentrations to their respective FDEP residential SCTLs.

Chemical	Maximum Detected Concentration (mg/kg)		FDEP SCTL (mg/kg)
	Surface Soil	Subsurface Soil	
Aluminum	13,500	10,000	72,000
Antimony	5.8	Not Applicable	26
Arsenic	3.1	3.5	0.8
Iron	51,700	8,620	23,000
Manganese	457	Not Applicable	1,600
Thallium	0.53	Not Applicable	6.3

The SCTLs presented for aluminum, antimony, iron, manganese, and thallium are based on the potential for non-cancer health effects. The maximum detected concentration of aluminum in surface soil is approximately one-fifth of the SCTL, and the maximum detected concentration in subsurface soil is approximately one-seventh of the SCTL. The maximum detected concentration of iron in surface soil is 2.2 times the SCTL, and the maximum detected concentration is subsurface soil is approximately one-third of the SCTL. RfDs for aluminum and iron are based on allowable intakes rather than on adverse effect levels; consequently, an exceedance of the SCTL is not a definitive indication of the potential for adverse, non-cancer health effects. The maximum detected concentration of antimony in surface soil is approximately one-fourth of the SCTL. The maximum detected concentration of manganese in surface soil is approximately one-third of the SCTL. The maximum detected concentration of thallium in surface soil is approximately one-twelve of the SCTL.

The SCTLs presented for arsenic are based on the potential for cancer effects and represent the 1 x 10^{-6} (one-in-one million) cancer risk level (the values are the COPC screening levels used in this HHRA). SCTLs representing the 1 x 10^{-5} and 1 x 10^{-4} cancer risk levels would be 10 and 100 times, respectively, greater than the values presented for the 1 x 10^{-6} cancer risk level. Consequently, the maximum detected concentrations of arsenic in surface and subsurface soil exceed the 1 x 10^{-6} cancer risk levels but not the 1 x 10^{-5} and 1 x 10^{-4} risk levels.

12.5.3 Evaluation of Deep Subsurface Soils

A risk assessment evaluation of chemical concentrations detected in relatively shallow subsurface soils (i.e., soils between 2 feet and 15 feet bgs) for Site 18 was presented in Sections 12.3.2 and 12.4.2.2. The risk assessment evaluation of chemical concentrations in soil samples collected from greater than 15 feet bgs is presented in Tables 12-12 through 12-15. TRPH was the only parameter selected as a COPC using USEPA methodology or as a potential COC using FDEP methodology. The maximum detected TRPH concentration exceeds the Level 1 SCTL (residential) but not the Level 2 SCTL (industrial).

12.6 SUMMARY AND CONCLUSIONS

An HHRA was conducted for the chemical concentrations detected in 47 surface soil and 24 subsurface soil samples collected at Site 18. The evaluation was conducted using both USEPA and State of Florida regulations and guidelines for HHRA. The risk assessment considered five receptors, the hypothetical future resident, the typical industrial worker, the construction worker, the maintenance worker, and the recreational user, assuming exposure via the ingestion, dermal contact, and inhalation routes of exposure. However, with the possible exception of the maintenance worker, none of the receptors are currently contacting surface or subsurface soils at Site 18. The risk evaluations performed using USEPA guidelines and State of Florida regulations and guidelines yielded comparable results.

A 24-inch permeable soil layer and native grass cover were emplaced over the surface soil of Site 18 in 1999 (Bechtel, 2000). Consequently, the surface soil data evaluated in this risk assessment actually represent the shallow subsurface soils underlying this permeable cap. This is an important consideration when interpreting the risk characterization results summarized below because, barring construction activities or an excavation bringing contaminated soils to the surface, the emplacement of the cap has eliminated direct receptor contact (and risk) to the soils underlying the cap. According to Section 62-780.680(2)(b)(2) of proposed Rule 62-780, FAC, the criterion for direct contact exposure under Risk Management Option Level II is met by the emplacement of an engineering control preventing human exposure, such as a permanent cover material or 2 feet of soil.

Three organics (cPAHs, 2-methylnaphthalene, and naphthalene), four inorganics (barium, cadmium, chromium, and copper), and TRPHs were selected as COPCs for surface soil and evaluated in the quantitative HHRA conducted per USEPA guidelines. 2-Methylnaphthalene, naphthalene, and TRPH were selected as COPCs for subsurface soil and also evaluated per USEPA guidelines. The non-cancer risk estimates (i.e., HIs) developed for the resident, industrial worker, and construction worker exposed to TRPH in surface soils and for the resident and construction worker exposed to TRPH in subsurface soils exceeded 1 indicating a potential for non-carcinogenic health effects. However, the HIs developed for all other COPCs in surface or subsurface soil did not exceed 1. Although the cancer risk estimate developed for the COPCs for surface soil for the hypothetical future resident and the typical industrial worker exceeded the State of Florida cancer risk benchmark of 1×10^{-6}, none of the cancer risk estimates exceed the USEPA cancer risk range of 1×10^{-4} to 1×10^{-6}. The primary risk drivers for surface soils were the carcinogenic PAHs; chemical-specific risk estimates for all other COPCs are less than 4×10^{-9}. cPAHs were only detected in 1 of 47 surface soil samples; the TRPH concentration reported for this sample was 18,000 mg/kg.

The risk assessment conducted per the State of Florida regulations and guidelines evaluated risks to a hypothetical future resident and a typical industrial worker using published SCTLs for the residential and industrial land use scenarios, respectively. Additionally, risks to a hypothetical future recreational user were evaluated using SCTLs specifically developed for this risk assessment as allowed in the State of Florida regulations and guidelines. The following chemicals were identified as potential COCs for surface soils based on a comparison of EPCs to these SCTLs:

Residential SCTLs	Industrial SCTLs	Recreational SCTLs
cPAHs	cPAHs	cPAHs
TRPH	TRPH	
Barium		
Copper		

However, the predominant contaminant is TRPH. As noted above, cPAHs were detected in one surface soil sample only. The maximum concentration of copper (864 mg/kg) is greater than three times the SCTL, which is based on acute health effects (110 mg/kg). With one exception, the TRPH concentrations were also elevated in samples with copper concentrations exceeding this SCTL.

TRPH was the only contaminant selected as a potential COC for subsurface soils. The maximum detected concentration (7,190 mg/kg) and EPC (3,742 mg/kg) exceeded both residential and industrial SCTLs (340 mg/kg and 2,500 mg/kg, respectively).

TABLE 12-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
78-93-3	2-BUTANONE	6/47	0.017 J	1.7	0.011 - 1.5	18-SL-27	1.7	NA (13)	7300 N	730	3100 N	16000	Developmental	1000	5.5E-04	No	BSL
67-64-1	ACETONE	2/47	0.34 J	1.4 J	0.011 - 1.5	18-SL-37	1.4	NA	1600 N	160	780 N	11000	Kidney, Liver, Neurological	110	1.8E-03	No	BSL, FREQ
75-15-0	CARBON DISULFIDE	8/47	0.001 J	0.011 J	0.005 - 0.74	18-SL-31-D	0.011	NA	360 N	36	200 N	270	Developmental, Neurological	29	5.5E-05	No	BSL
100-41-4	ETHYLBENZENE	10/47	0.015 J	0.8	0.005 - 0.032	18-SL-33	0.8	NA	400 sat	400	1100 N	1500	Developmental, Kidney, Liver	160	7.3E-04	No	BSL
75-09-2	METHYLENE CHLORIDE	5/47	0.049 J	0.086 J	0.005 - 0.8	18-SL-32	0.086	NA	9.1 C	1.5	16 C	17	---	3	5.4E-03	No	BSL
108-88-3	TOLUENE	11/47	0.001 J	0.39 J	0.005 - 0.69	18-SL-33	0.39	NA	520 sat	520	380 N	7500	Kidney, Liver, Neurological	54	1.0E-03	No	BSL
1330-20-7	TOTAL XYLENES	32/47	0.001 J	7	0.005 - 0.032	18-SL-33	7	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	840	1.2E-03	No	BSL
	Semivolatile Organics (mg/kg)																
91-57-6	**2-METHYLNAPHTHALENE**	9/47	1.1 J	33 J	0.35 - 19	18-SL-27	33	NA	56 N	**5.6**	80 N	210	Body Weight, Nasal	**16**	4.1E-01	**Yes**	**ASL**
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1/47	0.44 J	0.44 J	0.35 - 20	18-SL-06	0.44	NA	---	---	---	---	---	---	---	No	NTX, FREQ
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	15/47	0.056 J	5.6 J	0.35 - 20	18-SL-23	5.6	NA	35 C	5.8	76 C	72	---	15	7.4E-02	No	BSL
206-44-0	FLUORANTHENE	1/47	3.5 J	3.5 J	0.35 - 20	18-SL-23	3.5	NA	2300 N	230	2900 N	3200	Blood, Kidney, Liver	410	1.2E-03	No	BSL, FREQ
86-73-7	FLUORENE	1/47	0.44	0.44	0.35 - 20	18-SL-13	0.44	NA	2700 N	270	2200 N	2600	Blood	550	2.0E-04	No	BSL, FREQ
91-20-3	**NAPHTHALENE**	9/47	0.99	8 J	0.35 - 11	18-SL-33	8	NA	56 N	**6**	40 N	55	Body Weight, Nasal	8	2.0E-01	**Yes**	**ASL**
85-01-8	PHENANTHRENE	3/47	0.12 J	2.2 J	0.35 - 20	18-SL-27	2.2	NA	2300 N	230	2000 N	2200	Kidney	290	1.1E-03	No	BSL
129-00-0	PYRENE	3/47	0.73 J	7.7 J	0.35 - 20	18-SL-23	7.7	NA	2300 N	230	2200 N	2400	Kidney	310	3.5E-03	No	BSL
50-32-8	**BAP EQUIVALENT**	1/47		1.3	0.35 - 20	18-SL-23	1.3	NA	0.062 C	**0.01**	0.1 C	0.1	---	**0.02**	**1.3E+01**	**Yes**	**ASL**
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	47/47	1510	13500	---	18-SL-31-D	13500	no	76000 N	**7600**	72000 N	80000	Body Weight	14400	1.9E-01	No	BKG
7440-36-0	ANTIMONY	5/47	2.9	5.8 J	2.6 - 4.4	18-SL-01-D	5.8	no	31 N	**3.1**	26 N	27	Blood, Mortality	**5.2**	2.2E-01	No	BKG
7440-38-2	ARSENIC	35/47	0.24 J	3.1	0.22 - 2.2	18-SL-31	3.1	no	0.39 C	**0.065**	0.8 C	2.1	---	**0.16**	**3.9E+00**	No	BKG
7440-39-3	**BARIUM**	47/47	2.5 J	290	---	18-SL-31-D	290	yes	5400 N	540	110 N	120	Cardiovascular	**110**	2.6E+00	**Yes**	**ASL**
7440-41-7	BERYLLIUM	23/47	0.06 J	0.14 J	0.05 - 0.09	18-SL-31-D	0.14	NE (14)	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.2E-03	No	BSL
7440-43-9	**CADMIUM**	23/47	0.6 J	38.8	0.58 - 0.72	18-SL-42	38.8	yes	37 N	**3.7**	75 N	82	Kidney	75	5.2E-01	**Yes**	**ASL**
7440-70-2	CALCIUM	36/47	63 J	1050 J	102 - 786	18-SL-20	1050	NE	---	---	---	---	---	---		No	NUT
7440-47-3	**CHROMIUM**	47/47	1.5 J	95.7 J	---	18-SL-10	95.7	yes	210 C	**35**	210 C	210	---	**42**	4.6E-01	**Yes**	**ASL**
7440-48-4	COBALT	29/47	0.4 J	5.9 J	0.34 - 4.8	18-SL-31-D	5.9	NE	900 C	150	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	671	1.3E-03	No	BSL
7440-50-8	**COPPER**	44/47	1.8 J	864	2.3 - 4.5	18-SL-01-D	864	yes	3100 N	**310**	110 N	150	Gastrointestinal	**110**	**7.9E+00**	**Yes**	**ASL**
7439-89-6	IRON	47/47	1140	51700	---	18-SL-31-D	51700	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**4600**	2.2E+00	No	BKG
7439-92-1	LEAD	43/47	3.2	168	4.6 - 16.1	18-SL-31-D	168	NE	400	400	400	400	---	400	4.2E-01	No	BSL
7439-95-4	MAGNESIUM	47/47	33.8 J	657 J	---	18-SL-31-D	657	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	47/47	12.1	457	---	18-SL-31-D	457	no	1800 N	**180**	1600 N	3500	Neurological	**229**	2.9E-01	No	BKG
7439-97-6	MERCURY	14/47	0.04 J	0.25	0.01 - 0.12	18-SL-23	0.25	NE	23 N	2.3	3.4 N	3	Neurological	0.49	7.4E-02	No	BSL
7440-02-0	NICKEL	23/47	2.5 J	19.7	2.3 - 11.4	18-SL-31-D	19.7	NE	1600 N	160	110 N	340	Body Weight	110	1.8E-01	No	BSL
7440-09-7	POTASSIUM	32/47	138 J	2930	129 - 158	18-SL-31-D	2930	NE	---	---	---	---	---	---	---	No	NUT
7440-22-4	SILVER	1/47	0.35 J	0.35 J	0.32 - 0.7	18-SL-03	0.35	NE	390 N	39	390 N	410	Skin	390	9.0E-04	No	BSL, FREQ
7440-23-5	SODIUM	36/47	137 J	302 J	127 - 270	18-SL-31-D	302	NE	---	---	---	---	---	---	---	No	NUT
7440-28-0	THALLIUM	1/47	0.53 J	0.53 J	0.34 - 0.73	18-SL-43	0.53	no	5.2 N	**0.52**	6.3 N	6.1	Liver	1.3	8.4E-02	No	FREQ, BKG
7440-62-2	VANADIUM	46/47	2.4 J	12.1	3.5 - 3.6	18-SL-42	12.1	no	550 N	55	15 N	67	NOEL	15	8.1E-01	No	BSL,BKG
7440-66-6	ZINC	39/47	4.3 J	779	7.3 - 77	18-SL-31-D	779	NE	23000 N	2300	23000 N	26000	Blood	4600	3.4E-02	No	BSL
	Petroleum Hydrocarbons (mg/kg)																
TTNUS001	**TRPH**	38/47	2.9	23500	1.7 - 1.9	18-SL-15	23500	NA	---	---	340	460	Multiple endpoints	**170**	**6.9E+01**	**Yes**	**ASL**

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 12-1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 6 chemicals detected in surface soil at Site 18 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 6. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 5 carcinogens were detected in surface soil at Site 18. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 5. For noncarcinogens, neurological effects were identified as the target organ for 7 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 7. Note that the non-apportioned SCTLs for barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL. and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

18-SL-01	18-SL-12	18-SL-24	18-SL-36
18-SL-01-D	18-SL-13	18-SL-25	18-SL-37
18-SL-02	18-SL-14	18-SL-26	18-SL-37-D
18-SL-03	18-SL-15	18-SL-27	18-SL-38
18-SL-04	18-SL-16	18-SL-28	18-SL-39
18-SL-05	18-SL-17	18-SL-29	18-SL-40
18-SL-06	18-SL-18	18-SL-30	18-SL-41
18-SL-07	18-SL-19	18-SL-31	18-SL-42
18-SL-08	18-SL-20	18-SL-31-D	18-SL-43
18-SL-09	18-SL-21	18-SL-32	18-SL-44
18-SL-10	18-SL-22	18-SL-33	18-SL-45
18-SL-10-D	18-SL-23	18-SL-34	18-SL-46
18-SL-11	18-SL-23-D	18-SL-35	18-SL-47

TABLE 12-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
78-93-3	2-BUTANONE	2/13	0.006 J	0.021 J	0.010 - 7.1	18SB6-5-7	0.021	NA (13)	7300 N	730	3100 N	16000	Developmental	1600	6.8E-06	No	BSL
108-10-1	4-METHYL-2-PENTANONE	2/13	0.003 J	0.017	0.010 - 7.1	18SB8-5-7	0.017	NA	790 N	79	220 N	4300	Kidney, Liver	55	7.7E-05	No	BSL
67-64-1	ACETONE	4/13	0.024	0.13	0.011 - 7.1	18SB10-5-7	0.13	NA	1600 N	160	780 N	11000	Kidney, Liver, Neurological	98	1.7E-04	No	BSL
1330-20-7	TOTAL XYLENES	3/13	0.016	8.7	0.010 - 1.3	18SB6-10-12	8.7	NA	270 N	27	5900 N	130	Body Weight, Mortality, Neurological	740	1.5E-03	No	BSL
	Semivolatile Organics (mg/kg)																
91-57-6	**2-METHYLNAPHTHALENE**	6/13	0.086 J	37 J	0.35 - 0.38	18SB6-10-12	37	NA	56 N	**5.6**	80 N	210	Body Weight, Nasal	**13**	4.6E-01	**Yes**	**ASL**
106-44-5	4-METHYLPHENOL	2/13	0.11 J	0.28 J	0.35 - 7.2	18SB8-5-7-D	0.28	NA	310 N	31	250 N	300	Maternal Death, Neurological, Respiratory	31	1.1E-03	No	BSL
132-64-9	DIBENZOFURAN	1/13	0.85 J	0.85 J	0.35 - 7.2	18SB6-10-12-D	0.85	NA	290 N	29	280 N	320	None Specified	93	3.0E-03	No	BSL
131-11-3	DIMETHYL PHTHALATE	1/13	0.04 J	0.04 J	0.35 - 7.2	18SB1-10-12	0.04	NA	100000 max	100000	590000 N	690000	Kidney	150000	6.8E-08	No	BSL
86-73-7	FLUORENE	3/13	0.056 J	0.57 J	0.35 - 7.2	18SB6-10-12-D	0.57	NA	2700 N	270	2200 N	2600	Blood	730	2.6E-04	No	BSL
91-20-3	**NAPHTHALENE**	3/13	0.23 J	16 J	0.35 - 0.7	18SB6-10-12	16	NA	56 N	**5.6**	40 N	55	Body Weight, Nasal	**7**	4.0E-01	**Yes**	**ASL**
85-01-8	PHENANTHRENE	2/13	0.042 J	0.058 J	0.35 - 7.2	18SB8-10-12	0.058	NA	2300 N	230	2000 N	2200	Kidney	500	2.9E-05	No	BSL
108-95-2	PHENOL	1/13	0.089 J	0.1 J	0.35 - 7.2	18SB8-5-7-D	0.1	NA	37000 N	3700	900 N	500	Developmental	900	1.1E-04	No	BSL
	Pesticides PCBs (mg/kg)																
72-54-8	4,4'-DDD	1/13	0.0041 J	0.0041 J	0.0035 - 0.0038	18SB1-5-7	0.0041	NA	2.4 C	0.6	4.6 C	4.2	---	2	8.9E-04	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	13/13	860	10000 J	---	18SB8-5-7	10000	no	76000 N	**7600**	72000 N	80000	Body Weight	12000	1.4E-01	No	BKG
7440-38-2	ARSENIC	13/13	0.58 J	3.5 J	---	18SB8-5-7	3.5	no	0.39 C	**0.10**	0.8 C	2.1	---	**0.27**	**4.4E+00**	No	BKG
7440-39-3	BARIUM	13/13	0.72 J	7.8 J	---	18SB9-5-7	7.8	NE (14)	5400 N	540	110 N	120	Cardiovascular	110	7.1E-02	No	BSL
7440-41-7	BERYLLIUM	5/13	0.06 J	0.09 J	0.06	18SB8-5-7, 18SB8-5-7-D, 18SB1-10-12	0.09	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	7.5E-04	No	BSL
7440-70-2	CALCIUM	9/13	7.3 J	180 J	6.9 - 27.2	18SB6-5-7	180	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	13/13	1.4 J	10.4	---	18SB10-5-7	10.4	NE	210 C	53	210 C	210	---	70	5.0E-02	No	BSL
7440-48-4	COBALT	7/13	0.53 J	1 J	0.47 - 0.51	18SB8-5-7	1	NE	900 C	225	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	588	2.1E-04	No	BSL
7440-50-8	COPPER	11/13	0.36 J	7	0.36 - 1.3	18SB4-5-7	7	NE	3100 N	3100	110 N	150	Gastrointestinal	110	6.4E-02	No	BSL
7439-89-6	IRON	13/13	528	8620 J	---	18SB8-5-7	8620	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	**7670**	3.7E-01	No	BKG
7439-92-1	LEAD	13/13	0.45 J	11.1	---	18SB9-5-7	11.1	NE	400	400	400	400	---	400	2.8E-02	No	BSL
7439-95-4	MAGNESIUM	12/13	12.9 J	151 J	15.8 - 48.6	18SB4-5-7	151	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	13/13	2.8 J	63	---	18SB6-5-7	63	no	1800 N	180	1600 N	3500	Neurological	200	3.9E-02	No	BSL,BKG
7439-97-6	MERCURY	3/13	0.02 J	0.05	0.02	18SB1-10-12	0.05	NE	23 N	2.3	3.4 N	3	Neurological	0.43	1.5E-02	No	BSL
7440-02-0	NICKEL	2/13	2.7 J	2.9 J	2.6 - 3	18SB1-5-7	2.9	NE	1600 N	160	110 N	340	Body Weight	110	2.6E-02	No	BSL
7440-09-7	POTASSIUM	8/13	109 J	1230	108 - 125	18SB8-10-12	1230	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	1/13	1 J	1.4 J	0.44 - 0.8	18SB8-5-7	1.4	NE	390 N	390	390 N	440	Hair Loss, Neurological, Skin	48.8	3.6E-03	No	BSL
7440-23-5	SODIUM	3/13	13.3 J	29.8 J	11.6 - 32.6	18SB6-5-7	29.8	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	13/13	1.4 J	23.9	---	18SB10-5-7	23.9	no	550 N	55	15 N	67	NOEL	**15**	1.6E+00	No	BKG
7440-66-6	ZINC	12/13	0.58 J	4.5	0.92 - 2.4	18SB4-5-7	4.5	NE	23000 N	2300	23000 N	26000	Blood	7670	2.0E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	12/13	0.41 J	3.3	0.44 - 0.45	18SB9-5-7	3.3	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	1.1E-01	No	BSL
	Petroleum Hydrocarbons (mg/kg)																
TTNUS001	**TRPH**	11/13	2.3	7190	1.8 - 1.9	18SB6-10-12-D	7190	NA	---	---	340 N	460	Multiple Endpoints	**113**	**2.1E+01**	**Yes**	**ASL**

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 12-2

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a COPC.
5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 4 chemicals detected in subsurface soil at Site 18 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 4. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs are presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 3 carcinogens were detected in subsurface soil at Site 18. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 3. For noncarcinogens, neurological effects were identified as the target organ for 8 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 8. Note that the non-apportioned SCTLs for phenol, barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
max = Region 9 non-risk based "ceiling limit" concentration for less toxic chemicals
N = Noncarcinogen.
NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

TABLE 12-3

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 18, CRASH CREW TRAINING AREA B
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Receptor	Media	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals with HI > 1
Hypothetical Future Residents	Surface Soil	1E-05	- -	- -	Carcinogenic PAHs	0.3	- -
	Subsurface Soil	NTX	- -	- -	- -	0.2	- -
Industrial Workers	Surface Soil	2E-06	- -	- -	Carcinogenic PAHs	0.03	- -
	Subsurface Soil	NTX	- -	- -	- -	0.02	- -
Construction Workers	Surface Soil	1E-06	- -	- -	- -	0.2	- -
	Subsurface Soil	NTX	- -	- -	- -	0.07	- -
Maintenance Workers	Surface Soil	5E-07	- -	- -	- -	0.003	- -
Adolescent Recreational Users	Surface Soil	8E-07	- -	- -	- -	0.008	- -
Adult Recreational Users	Surface Soil	7E-07	- -	- -	- -	0.005	- -
Lifelong Recreational Users	Surface Soil	1E-06	- -	- -	- -	NA	- -

Notes:
NTX - Not applicable. There are no cancer slope factors (CSF) available for chemicals retained as COPCs.
NA - Not applicable.
HI - Hazard Index.

TABLE 12-4

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	1.7	0.5	3100	N	5.5E-04	NA (6)	No	maximum < SCTL
67-64-1	ACETONE	1.4 J	0.4	780	N	1.8E-03	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.011 J	0.01	200	N	5.5E-05	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.8	0.3	1100	N	7.3E-04	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.086 J	0.09	16	C	5.4E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.39 J	0.2	380	N	1.0E-03	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	7	2	5900	N	1.2E-03	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	33 J	14	80	N	4.1E-01	NA	No	maximum < SCTL
111-91-1	BIS(2-CHLOROETHOXY)METHANE	0.44 J	0.4	---		---	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5.6 J	5	76	C	7.4E-02	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	3.5 J	4	2900	N	1.2E-03	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.44	0.4	2200	N	2.0E-04	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	8 J	4	40	N	2.0E-01	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	2.2 J	2	2000	N	1.1E-03	NA	No	maximum < SCTL
129-00-0	PYRENE	7.7 J	5	2200	N	3.5E-03	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	1.3	1.2	0.1	C	**1.3E+01**	NA	**Yes**	maximum > SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	13500	4420	72000	N	1.9E-01	no	No	maximum < SCTL
7440-36-0	ANTIMONY	5.8 J	1.7	26	N	2.2E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.1	0.73	0.8	C	**3.9E+00**	no	No	(8)
7440-39-3	**BARIUM**	290	97.1	110	N	**2.6E+00**	yes	**Yes**	maximum > SCTL
7440-41-7	BERYLLIUM	0.14 J	0.067	120	N	1.2E-03	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	38.8	14	75	N	5.2E-01	yes	No	maximum < SCTL
7440-70-2	CALCIUM	1050 J	268	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	95.7 J	16	210	C	4.6E-01	no	No	maximum < SCTL
7440-48-4	COBALT	5.9 J	1	4700	N	1.3E-03	NE	No	maximum < SCTL
7440-50-8	**COPPER**	864	164	110	N	**7.9E+00**	yes	**Yes**	maximum > SCTL
7439-89-6	IRON	51700	9020	23000	N	**2.2E+00**	no	No	(8)
7439-92-1	LEAD	168	31.7	400		4.2E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	657 J	138	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	457	71.1	1600	N	2.9E-01	no	No	maximum < SCTL
7439-97-6	MERCURY	0.25	0.054	3.4	N	7.4E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	19.7	4.6	110	N	1.8E-01	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	2930	534	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.35 J	0.18	390	N	9.0E-04	NE	No	maximum < SCTL

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7440-23-5	SODIUM	302 J	175	---		---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.53 J	0.22	6.3	N	8.4E-02	no	No	maximum < SCTL
7440-62-2	VANADIUM	12.1	5.5	15	N	8.1E-01	no	No	maximum < SCTL
7440-66-6	ZINC	779	194	23000	N	3.4E-02	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	**TRPH**	23500	6770	340		**6.9E+01**	NA	**Yes**	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:				
18-SL-01	18-SL-10	18-SL-20	18-SL-30	18-SL-39
18-SL-01-D	18-SL-10-D	18-SL-21	18-SL-31	18-SL-40
18-SL-02	18-SL-11	18-SL-22	18-SL-31-D	18-SL-41
18-SL-03	18-SL-12	18-SL-23	18-SL-32	18-SL-42
18-SL-04	18-SL-13	18-SL-23-D	18-SL-33	18-SL-43
18-SL-05	18-SL-14	18-SL-24	18-SL-34	18-SL-44
18-SL-06	18-SL-15	18-SL-25	18-SL-35	18-SL-45
18-SL-07	18-SL-16	18-SL-26	18-SL-36	18-SL-46
18-SL-08	18-SL-17	18-SL-27	18-SL-37	18-SL-47
18-SL-09	18-SL-18	18-SL-28	18-SL-37-D	
	18-SL-19	18-SL-29	18-SL-38	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	6/47	1.7	0.2	18-SL-27	NA (5)	25000
67-64-1	ACETONE	2/47	1.4 J	0.2	18-SL-37	NA	100000
75-15-0	CARBON DISULFIDE	8/47	0.011 J	0.011	18-SL-31-D	NA	730
100-41-4	ETHYLBENZENE	10/47	0.8	0.08	18-SL-33	NA	400
75-09-2	METHYLENE CHLORIDE	5/47	0.086 J	0.08	18-SL-32	NA	2400
108-88-3	TOLUENE	11/47	0.39 J	0.05	18-SL-33	NA	650
1330-20-7	TOTAL XYLENES	32/47	7	0.6	18-SL-33	NA	140
	Semivolatile Organics (mg/kg)						
91-57-6	2-METHYLNAPHTHALENE	9/47	33 J	5	18-SL-27	NA	---
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1/47	0.44 J	0.44	18-SL-06	NA	---
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	15/47	5.6 J	2	18-SL-23	NA	31000
206-44-0	FLUORANTHENE	1/47	3.5 J	2	18-SL-23	NA	---
86-73-7	FLUORENE	1/47	0.44	0.44	18-SL-13	NA	160
91-20-3	NAPHTHALENE	9/47	8 J	2	18-SL-33	NA	220
85-01-8	PHENANTHRENE	3/47	2.2 J	2	18-SL-27	NA	---
129-00-0	PYRENE	3/47	7.7 J	2	18-SL-23	NA	85
50-32-8	BAP EQUIVALENT	1/47	1.3	1.2	18-SL-23	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	38/47	23500	7820	18-SL-15	NA	---

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

TABLE 12-5

COMPARISON TO SOIL SATURATION LIMIT - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)

Associated Samples:

18-SL-01	18-SL-12	18-SL-24	18-SL-36
18-SL-01-D	18-SL-13	18-SL-25	18-SL-37
18-SL-02	18-SL-14	18-SL-26	18-SL-37-D
18-SL-03	18-SL-15	18-SL-27	18-SL-38
18-SL-04	18-SL-16	18-SL-28	18-SL-39
18-SL-05	18-SL-17	18-SL-29	18-SL-40
18-SL-06	18-SL-18	18-SL-30	18-SL-41
18-SL-07	18-SL-19	18-SL-31	18-SL-42
18-SL-08	18-SL-20	18-SL-31-D	18-SL-43
18-SL-09	18-SL-21	18-SL-32	18-SL-44
18-SL-10	18-SL-22	18-SL-33	18-SL-45
18-SL-10-D	18-SL-23	18-SL-34	18-SL-46
18-SL-11	18-SL-23-D	18-SL-35	18-SL-47

TABLE 12-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	1.7	0.5	21000 N	8.1E-05	NA (6)	No	maximum < SCTL
67-64-1	ACETONE	1.4 J	0.4	5500 N	2.5E-04	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.011 J	0.01	1400 N	7.9E-06	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.8	0.3	8400 N	9.5E-05	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.086 J	0.09	23 C	3.7E-03	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.39 J	0.2	2600 N	1.5E-04	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	7	2	40000 N	1.8E-04	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	33 J	14	560 N	5.9E-02	NA	No	maximum < SCTL
111-91-1	BIS(2-CHLOROETHOXY)METHANE	0.44 J	0.4	---	---	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5.6 J	5	280 C	2.0E-02	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	3.5 J	4	48000 N	7.3E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.44	0.4	28000 N	1.6E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	8 J	4	270 N	3.0E-02	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	2.2 J	2	30000 N	7.3E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	7.7 J	5	37000 N	2.1E-04	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	1.3	1.2	0.5 C	**2.7E+00**	NA	**Yes**	maximum > SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	13500	4420	--- N	---	no	No	maximum < SCTL
7440-36-0	ANTIMONY	5.8 J	1.7	240 N	2.4E-02	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.1	0.73	3.7 C	8.4E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	290	97.1	87000 N	3.3E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.067	800 N	1.8E-04	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	38.8	14	1300 N	3.0E-02	yes	No	maximum < SCTL
7440-70-2	CALCIUM	1050 J	268	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	95.7 J	16	420 C	2.3E-01	no	No	maximum < SCTL
7440-48-4	COBALT	5.9 J	1	110000 N	5.4E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	864	164	76000 N	1.1E-02	yes	No	maximum < SCTL
7439-89-6	IRON	51700	9020	480000 N	1.1E-01	no	No	maximum < SCTL
7439-92-1	LEAD	168	31.7	920	1.8E-01	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	657 J	138	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	457	71.1	22000 N	2.1E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.25	0.054	26 N	9.6E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	19.7	4.6	28000 N	7.0E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	2930	534	---	---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.35 J	0.18	9100 N	3.8E-05	NE	No	maximum < SCTL

TABLE 12-6

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7440-23-5	SODIUM	302 J	175	---	---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.53 J	0.22	160 N	3.3E-03	no	No	maximum < SCTL
7440-62-2	VANADIUM	12.1	5.5	7400 N	1.6E-03	no	No	maximum < SCTL
7440-66-6	ZINC	779	194	560000 N	1.4E-03	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	**TRPH**	23500	6770	2500	**9.4E+00**	NA	**Yes**	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:	18-SL-10	18-SL-20	18-SL-30	18-SL-39
18-SL-01	18-SL-10-D	18-SL-21	18-SL-31	18-SL-40
18-SL-01-D	18-SL-11	18-SL-22	18-SL-31-D	18-SL-41
18-SL-02	18-SL-12	18-SL-23	18-SL-32	18-SL-42
18-SL-03	18-SL-13	18-SL-23-D	18-SL-33	18-SL-43
18-SL-04	18-SL-14	18-SL-24	18-SL-34	18-SL-44
18-SL-05	18-SL-15	18-SL-25	18-SL-35	18-SL-45
18-SL-06	18-SL-16	18-SL-26	18-SL-36	18-SL-46
18-SL-07	18-SL-17	18-SL-27	18-SL-37	18-SL-47
18-SL-08	18-SL-18	18-SL-28	18-SL-37-D	
18-SL-09	18-SL-19	18-SL-29	18-SL-38	

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	1.7	0.5	750000	N	2.3E-06	NA (6)	No	maximum < SCTL
67-64-1	ACETONE	1.4 J	0.4	800000	N	1.8E-06	NA	No	maximum < SCTL
75-15-0	CARBON DISULFIDE	0.011 J	0.01	21000	N	5.2E-07	NA	No	maximum < SCTL
100-41-4	ETHYLBENZENE	0.8	0.3	100000	N	8.0E-06	NA	No	maximum < SCTL
75-09-2	METHYLENE CHLORIDE	0.086 J	0.09	290	C	3.0E-04	NA	No	maximum < SCTL
108-88-3	TOLUENE	0.39 J	0.2	40000	N	9.8E-06	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	7	2	19000	N	3.7E-04	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	33 J	14	12000	N	2.8E-03	NA	No	maximum < SCTL
111-91-1	BIS(2-CHLOROETHOXY)METHANE	0.44 J	0.4	---		---	NA	No	maximum < SCTL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5.6 J	5	480	C	1.2E-02	NA	No	maximum < SCTL
206-44-0	FLUORANTHENE	3.5 J	4	64000	N	5.5E-05	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.44	0.4	140000	N	3.1E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	8 J	4	4400	N	1.8E-03	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	2.2 J	2	110000	N	2.0E-05	NA	No	maximum < SCTL
129-00-0	PYRENE	7.7 J	5	110000	N	7.0E-05	NA	No	maximum < SCTL
50-32-8	**BAP EQUIVALENT**	1.3	1.2	0.8	C	**1.7E+00**	NA	**Yes**	maximum > SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	13500	4420	---	N	---	no	No	(8)
7440-36-0	ANTIMONY	5.8 J	1.7	1500	N	3.9E-03	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.1	0.73	6.2	C	5.0E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	290	97.1	250000	N	1.2E-03	yes	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.067	7200	N	1.9E-05	NE (7)	No	maximum < SCTL
7440-43-9	CADMIUM	38.8	14	1300	N	3.0E-02	yes	No	maximum < SCTL
7440-70-2	CALCIUM	1050 J	268	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	95.7 J	16	5900	C	1.6E-02	no	No	maximum < SCTL
7440-48-4	COBALT	5.9 J	1	25000	N	2.4E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	864	164	150000	N	5.8E-03	yes	No	maximum < SCTL
7439-89-6	IRON	51700	9020	1100000	N	4.7E-02	no	No	maximum < SCTL
7439-92-1	LEAD	168	31.7	1900		8.8E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	657 J	138	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	457	71.1	69000	N	6.6E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.25	0.054	1100	N	2.3E-04	NE	No	maximum < SCTL
7440-02-0	NICKEL	19.7	4.6	73000	N	2.7E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	2930	534	---		---	NE	No	Essential Nutrient
7440-22-4	SILVER	0.35 J	0.18	18200	N	1.9E-05	NE	No	maximum < SCTL

TABLE 12-7

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
7440-23-5	SODIUM	302 J	175	---	---	NE	No	Essential Nutrient
7440-28-0	THALLIUM	0.53 J	0.22	260 N	2.0E-03	no	No	maximum < SCTL
7440-62-2	VANADIUM	12.1	5.5	3600 N	3.4E-03	no	No	maximum < SCTL
7440-66-6	ZINC	779	194	1100000 N	7.1E-04	NE	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	TRPH	23500	6770	31000	7.6E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 SCTLs for recreational users were developed using the methods presented in Chapter 62-777, F.A.C., August 1999 and the most current toxicological data available in IRIS. The recreational users are assumed to b exposed 45 days per year by ingestion, inhalation, and dermal contact. Calculations of the recreational SCTLs are presented in Appendix C.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:
18-SL-01
18-SL-01-D
18-SL-02
18-SL-03
18-SL-04
18-SL-05
18-SL-06
18-SL-07
18-SL-08
18-SL-09
18-SL-10
18-SL-10-D
18-SL-11
18-SL-12
18-SL-13
18-SL-14
18-SL-15
18-SL-16
18-SL-17
18-SL-18
18-SL-19
18-SL-20
18-SL-21
18-SL-22
18-SL-23
18-SL-23-D
18-SL-24
18-SL-25
18-SL-26
18-SL-27
18-SL-28
18-SL-29
18-SL-30
18-SL-31
18-SL-31-D
18-SL-32
18-SL-33
18-SL-34
18-SL-35
18-SL-36
18-SL-37
18-SL-37-D
18-SL-38
18-SL-39
18-SL-40
18-SL-41
18-SL-42
18-SL-43
18-SL-44
18-SL-45
18-SL-46
18-SL-47

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.021 J	0.021	3100 N	6.8E-06	NA (6)	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.017	0.01	220 N	7.7E-05	NA	No	maximum < SCTL
67-64-1	ACETONE	0.13	0.13	780 N	1.7E-04	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	8.7	2	5900 N	1.5E-03	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	37 J	7	80 N	4.6E-01	NA	No	maximum < SCTL
106-44-5	4-METHYLPHENOL	0.28 J	0.3	250 N	1.1E-03	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.85 J	0.3	280 N	3.0E-03	NA	No	maximum < SCTL
131-11-3	DIMETHYL PHTHALATE	0.04 J	0.04	590000 N	6.8E-08	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.57 J	0.3	2200 N	2.6E-04	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	16 J	3	40 N	4.0E-01	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.058 J	0.058	2000 N	2.9E-05	NA	No	maximum < SCTL
108-95-2	PHENOL	0.1 J	0.09	900 N	1.1E-04	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.0041 J	0.002	4.6 C	8.9E-04	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	10000 J	5240	72000 N	1.4E-01	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.5 J	2.1	0.8 C	**4.4E+00**	no	No	(8)
7440-39-3	BARIUM	7.8 J	6.3	110 N	7.1E-02	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.09 J	0.059	120 N	7.5E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	180 J	85.5	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	10.4	6.9	210 C	5.0E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1 J	0.62	4700 N	2.1E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	7	4.1	110 N	6.4E-02	NE	No	maximum < SCTL
7439-89-6	IRON	8620 J	5290	23000 N	3.7E-01	no	No	maximum < SCTL
7439-92-1	LEAD	11.1	3.31	400	2.8E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	151 J	85.7	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	63	30.8	1600 N	3.9E-02	no	No	maximum < SCTL
7439-97-6	MERCURY	0.05	0.022	3.4 N	1.5E-02	NE	No	maximum < SCTL
7440-02-0	NICKEL	2.9 J	1.8	110 N	2.6E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1230	594	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	1.4 J	0.45	390 N	3.6E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	29.8 J	12.9	---	---	NE	No	Essential Nutrient

TABLE 12-8

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
7440-62-2	VANADIUM	23.9	18.5	15	N	1.6E+00	no	No	(8)
7440-66-6	ZINC	4.5	2.9	23000	N	2.0E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	3.3	1	30	N	1.1E-01	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	7190	3742	340	N	2.1E+01	NA	Yes	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-9

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
78-93-3	2-BUTANONE	2/13	0.021 J	0.021	18SB6-5-7	NA (5)	25000
108-10-1	4-METHYL-2-PENTANONE	2/13	0.017	0.01	18SB8-5-7	NA	3600
67-64-1	ACETONE	4/13	0.13	0.13	18SB10-5-7	NA	100000
1330-20-7	TOTAL XYLENES	3/13	8.7	2	18SB6-10-12	NA	140
	Semivolatile Organics (mg/kg)						
91-57-6	2-METHYLNAPHTHALENE	6/13	37 J	7	18SB6-10-12	NA	---
106-44-5	4-METHYLPHENOL	2/13	0.28 J	0.3	18SB8-5-7-D	NA	---
132-64-9	DIBENZOFURAN	1/13	0.85 J	0.3	18SB6-10-12-D	NA	210
131-11-3	DIMETHYL PHTHALATE	1/13	0.04 J	0.04	18SB1-10-12	NA	1200
86-73-7	FLUORENE	3/13	0.57 J	0.3	18SB6-10-12-D	NA	160
91-20-3	NAPHTHALENE	3/13	16 J	3	18SB6-10-12	NA	220
85-01-8	PHENANTHRENE	2/13	0.058 J	0.058	18SB8-10-12	NA	---
108-95-2	PHENOL	1/13	0.1 J	0.09	18SB8-5-7-D	NA	---
	Pesticides PCBs (mg/kg)						
72-54-8	4,4'-DDD	1/13	0.0041 J	0.002	18SB1-5-7	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	11/13	7190	3742	18SB6-10-12-D	NA	---

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.
4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

TABLE 12-10

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA
PAGE 1 OF 2

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
78-93-3	2-BUTANONE	0.021 J	0.021	21000	N	1.0E-06	NA (6)	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.017	0.01	1500	N	1.1E-05	NA	No	maximum < SCTL
67-64-1	ACETONE	0.13	0.13	5500	N	2.4E-05	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	8.7	2	40000	N	2.2E-04	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	37 J	7	560	N	6.6E-02	NA	No	maximum < SCTL
106-44-5	4-METHYLPHENOL	0.28 J	0.3	3000	N	9.3E-05	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.85 J	0.3	5000	N	1.7E-04	NA	No	maximum < SCTL
131-11-3	DIMETHYL PHTHALATE	0.04 J	0.04	---	N	---	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.57 J	0.3	28000	N	2.0E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	16 J	3	270	N	5.9E-02	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.058 J	0.058	30000	N	1.9E-06	NA	No	maximum < SCTL
108-95-2	PHENOL	0.1 J	0.09	390000	N	2.6E-07	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-54-8	4,4'-DDD	0.0041 J	0.002	18	C	2.3E-04	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	10000 J	5240	---	N	---	no	No	maximum < SCTL
7440-38-2	ARSENIC	3.5 J	2.1	3.7	C	9.5E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	7.8 J	6.3	87000	N	9.0E-05	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.09 J	0.059	800	N	1.1E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	180 J	85.5	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	10.4	6.9	420	C	2.5E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	1 J	0.62	110000	N	9.1E-06	NE	No	maximum < SCTL
7440-50-8	COPPER	7	4.1	76000	N	9.2E-05	NE	No	maximum < SCTL
7439-89-6	IRON	8620 J	5290	480000	N	1.8E-02	no	No	maximum < SCTL
7439-92-1	LEAD	11.1	3.31	920		1.2E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	151 J	85.7	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	63	30.8	22000	N	2.9E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.05	0.022	26	N	1.9E-03	NE	No	maximum < SCTL
7440-02-0	NICKEL	2.9 J	1.8	28000	N	1.0E-04	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1230	594	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	1.4 J	0.45	10000	N	1.4E-04	NE	No	maximum < SCTL
7440-23-5	SODIUM	29.8 J	12.9	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	23.9	18.5	7400	N	3.2E-03	no	No	maximum < SCTL

TABLE 12-10

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
7440-66-6	ZINC	4.5	2.9	560000 N	8.0E-06	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)							
57-12-5	CYANIDE	3.3	1	39000 N	8.5E-05	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)							
TTNUS001	**TRPH**	7190	3742	2500 N	**2.9E+00**	NA	**Yes**	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-11

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)							
78-93-3	2-BUTANONE	0.021 J	0.021	750000 N	2.8E-08	NA (6)	No	maximum < SCTL
108-10-1	4-METHYL-2-PENTANONE	0.017	0.01	480000 N	3.5E-08	NA	No	maximum < SCTL
67-64-1	ACETONE	0.13	0.13	800000 N	1.6E-07	NA	No	maximum < SCTL
1330-20-7	TOTAL XYLENES	8.7	2	19000 N	4.6E-04	NA	No	maximum < SCTL
	Semivolatile Organics (mg/kg)							
91-57-6	2-METHYLNAPHTHALENE	37 J	7	12000 N	3.1E-03	NA	No	maximum < SCTL
106-44-5	4-METHYLPHENOL	0.28 J	0.3	8500 N	3.3E-05	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.85 J	0.3	5900 N	1.4E-04	NA	No	maximum < SCTL
131-11-3	DIMETHYL PHTHALATE	0.04 J	0.04	17000000 N	---	NA	No	maximum < SCTL
86-73-7	FLUORENE	0.57 J	0.3	140000 N	4.1E-06	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	16 J	3	4400 N	3.6E-03	NA	No	maximum < SCTL
85-01-8	PHENANTHRENE	0.058 J	0.058	110000 N	5.3E-07	NA	No	maximum < SCTL
108-95-2	PHENOL	0.1 J	0.09	500000 N	2.0E-07	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)							
72-54-8	4,4'-DDD	0.0041 J	0.002	39 C	1.1E-04	NA	No	maximum < SCTL
	Inorganics (mg/kg)							
7429-90-5	ALUMINUM	10000 J	5240	--- N	---	no	No	(8)
7440-38-2	ARSENIC	3.5 J	2.1	6.2 C	5.6E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	7.8 J	6.3	250000 N	3.1E-05	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.09 J	0.059	7200 N	1.3E-05	NE	No	maximum < SCTL
7440-70-2	CALCIUM	180 J	85.5	---	---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	10.4	6.9	5900 C	1.8E-03	NE	No	maximum < SCTL
7440-48-4	COBALT	1 J	0.62	25000 N	4.0E-05	NE	No	maximum < SCTL
7440-50-8	COPPER	7	4.1	150000 N	4.7E-05	NE	No	maximum < SCTL
7439-89-6	IRON	8620 J	5290	1100000 N	7.8E-03	no	No	maximum < SCTL
7439-92-1	LEAD	11.1	3.31	1900	5.8E-03	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	151 J	85.7	---	---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	63	30.8	69000 N	9.1E-04	no	No	maximum < SCTL
7439-97-6	MERCURY	0.05	0.022	1100 N	4.5E-05	NE	No	maximum < SCTL
7440-02-0	NICKEL	2.9 J	1.8	73000 N	4.0E-05	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	1230	594	---	---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	1.4 J	0.45	18000 N	7.8E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	29.8 J	12.9	---	---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	23.9	18.5	3600 N	6.6E-03	no	No	maximum < SCTL
7440-66-6	ZINC	4.5	2.9	1100000 N	4.1E-06	NE	No	maximum < SCTL

TABLE 12-11

FLORIDA LEVEL 3 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Recreational SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Recreational SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 3 COC ? (5)	Rationale/Comments
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	3.3	1	37000	N	8.9E-05	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	7190	3742	31000	N	2.3E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.
2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.
3 SCTLs for recreational users were developed using the methods presented in Chapter 62-777, F.A.C., August 1999 and the most current toxicological data available in IRIS. The recreational users are assumed to b exposed 45 days per year by ingestion, inhalation, and dermal contact. Calculations of the recreational SCTLs are presented in Appendix C.
4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.
5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.
6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.
7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.
8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

Definitions:
C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-12

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL> 15 FEET BGS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)
	Volatile Organics (mg/kg)																
67-64-1	ACETONE	6/11	0.01 J	0.21	0.031 - 6.6	18SB4-25-27	0.21	NA	1600 N	160	780 N	11000	Kidney, Liver, Neurological	130	2.7E-04	No	BSL
	Semivolatile Organics (mg/kg)																
91-57-6	2-METHYLNAPHTHALENE	2/11	0.17 J	3.1	0.34 - 0.44	18SB4-15-17	3.1	NA	56 N	5.6	80 N	210	Body Weight, Nasal	20	3.9E-02	No	BSL
132-64-9	DIBENZOFURAN	1/11	0.063 J	0.063 J	0.34 - 0.69	18SB6-15-17	0.063	NA	290 N	29	280 N	320	None Specified	93	2.3E-04	No	BSL
91-20-3	NAPHTHALENE	2/11	0.68	1.1	0.34 - 0.44	18SB4-15-17	1.1	NA	56 N	5.6	40 N	55	Body Weight, Nasal	10	2.8E-02	No	BSL
	Pesticides PCBs (mg/kg)																
72-55-9	4,4'-DDE	1/11	0.0055 J	0.0055 J	0.0034 - 0.0037	18SB4-40-42	0.0055	NA	1.7 C	0.34	3.3 C	2.9	---	0.8	1.7E-03	No	BSL
50-29-3	4,4'-DDT	1/11	0.021 J	0.021 J	0.0034 - 0.0037	18SB4-40-42	0.021	NA	1.7 C	0.34	3.3 C	2.9	---	0.8	6.4E-03	No	BSL
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	11/11	382	11100	---	18SB4-40-42	11100	no	76000 N	**7600**	72000 N	80000	Body Weight	18000	1.5E-01	No	BKG
7440-38-2	ARSENIC	8/11	0.5 J	2 J	0.21 - 0.33	18SB4-40-42	2	no	0.39 C	**0.08**	0.8 C	2.1	---	**0.2**	2.5E+00	No	BKG
7440-39-3	BARIUM	11/11	0.46 J	33.3 J	---	18SB4-40-42	33.3	NE (14)	5400 N	540	110 N	120	Cardiovascular	110	3.0E-01	No	BSL
7440-41-7	BERYLLIUM	1/11	0.14 J	0.14 J	0.06	18SB4-40-42	0.14	NE	150 N	15	120 N	120	Gastrointestinal, Respiratory	40	1.2E-03	No	BSL
7440-70-2	CALCIUM	4/11	14.6 J	141 J	6.8 - 7.5	18SB4-40-42	141	NE	---	---	---	---	---	---	---	No	NUT
7440-47-3	CHROMIUM	11/11	1.2 J	39.7	---	18SB4-40-42	39.7	NE	210 C	42	210 C	210	---	52.5	1.9E-01	No	BSL
7440-48-4	COBALT	2/11	0.86 J	0.92 J	0.47 - 0.59	18SB8-15-17	0.92	NE	900 C	180	4700 N	1700	Cardiovascular, Immunological, Neurological, Reproductive	783	2.0E-04	No	BSL
7440-50-8	COPPER	5/11	0.42 J	3 J	0.35 - 0.38	18SB4-40-42	3	NE	3100 N	3100	110 N	150	Gastrointestinal	110	2.7E-02	No	BSL
7439-89-6	IRON	11/11	225	7610	---	18SB8-15-17	7610	no	23000 N	**2300**	23000 N	53000	Blood, Gastrointestinal	7670	3.3E-01	No	BKG
7439-92-1	LEAD	10/11	0.3 J	14.5	0.12	18SB4-40-42	14.5	NE	400	400	400	400	---	400	3.6E-02	No	BSL
7439-95-4	MAGNESIUM	7/11	8.9 J	300 J	7.4 - 7.7	18SB4-40-42	300	NE	---	---	---	---	---	---	---	No	NUT
7439-96-5	MANGANESE	11/11	0.44 J	15.5	---	18SB8-15-17	15.5	no	1800 N	180	1600 N	3500	Neurological	267	9.7E-03	No	BSL,BKG
7439-97-6	MERCURY	2/11	0.05	0.1 J	0.02	18SB4-40-42	0.1	NE	23 N	2.3	3.4 N	3	Neurological	0.57	2.9E-02	No	BSL
7440-09-7	POTASSIUM	5/11	110 J	841 J	107 - 117	18SB8-15-17	841	NE	---	---	---	---	---	---	---	No	NUT
7782-49-2	SELENIUM	1/11	1.1 J	1.1 J	0.44 - 0.79	18SB4-40-42	1.1	NE	390 N	390	390 N	440	Hair Loss, Neurological, Skin	65	2.8E-03	No	BSL
7782-49-2	SELENIUM	1/11	0.57 J	0.57 J	0.5 - 0.63	18SB8-15-17	0.57	NE	390 N	390	390 N	440	Hair Loss, Neurological, Skin	390	1.5E-03	No	BSL
7440-23-5	SODIUM	2/11	16.3 J	25.6 J	11.6 - 12.6	18SB4-40-42	25.6	NE	---	---	---	---	---	---	---	No	NUT
7440-62-2	VANADIUM	11/11	1.2 J	39.9	---	18SB4-40-42	39.9	no	550 N	55	15 N	67	NOEL	**15**	2.7E+00	No	BKG
7440-66-6	ZINC	11/11	0.63 J	13.1	---	18SB8-15-17	13.1	NE	23000 N	2300	23000 N	26000	Blood	11500	5.7E-04	No	BSL
	Miscellaneous Parameter (mg/kg)																
57-12-5	CYANIDE	11/11	0.27 J	0.7 J	---	18SB4-40-42	0.7	NA	1200 N	120	30 N	34	Body Weight, Neurological, Thyroid	30	2.3E-02	No	BSL
	Petroleum Hydrocarbons (mg/kg)																
TTNUS001	**TRPH**	9/11	2.4	612	1.7 - 2.1	18SB4-15-17	612	NA	---	---	340 N	460	Multiple Endpoints	**113**	1.8E+00	**Yes**	**ASL**

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

Footnotes:

1. Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2. Values presented are sample-specific quantitation limits.
3. The maximum detected concentration is used for screening purposes.
4. To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Attachment C. If the background comparisons determine that the site concentrations of a constituent are not significantly different from background, that chemical is not selected as a COC.

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
max = Region 9 non-risk based "ceiling limit" concentration for less toxic chemicals
N = Noncarcinogen.

TABLE 12-12

SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL> 15 FEET BGS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Range of Nondetects (2)	Sample of Maximum Detection	Concentration Used for Screening(3)	Site above Background ?(4)	USEPA Region 9 Residential PRGS (5)	Apportioned Screening Levels based on Region 9 PRGs Residential (6)	Non-Apportioned Florida Residential SCTL- Direct Contact (7)	Proposed Florida Residential SCTL - Direct Contact (8)	Target Organ (9)	Simple Apportioned Florida Residential SCTL- Direct Contact (10)	Maximum Concentration/ Non-apportioned Residential SCTL Ratio >3 ? (11)	COPC Flag	Rationale for Contaminant Deletion or Selection (12)

5 USEPA Region 9 Preliminary Remediation Goals (PRGs), October 2002.
6 Apportioned COPC screening levels for carcinogens are determined by dividing the non-apportioned PRGs by the number of chemicals classified as carcinogens by Region 9. For example, 5 chemicals detected in subsurface soil at Site 18 are classified as carcinogens. Therefore, the apportioned screening levels for carcinogens are the PRGs divided by 5. For noncarcinogens, the COPC screening level is based on a target hazard quotient of 0.1, as per USEPA Region 4 guidelines (USEPA Region 4, May 2000).
7 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
8 2004 Proposed Florida SCTLs presented in Comparison of Chapter 62-777, F.A.C. - May 26, 1999 Values vs. Proposed February 26, 2004 Values, online at http://fdep.ifas.ufl.edu/
9 Target organs are obtained from Table II, Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.
10 Values of the simple apportioned SCTLs are determined by dividing the non-apportioned SCTL by the number carcinogenic chemicals or by the number of target organs for noncarcinogens as defined by Chapter 62-777 F.A.C. For example, 4 carcinogens were detected in subsurface soil at Site 18. Therefore, the apportioned SCTL value for carcinogens is the non-apportioned SCTL divided by 4. For noncarcinogens, neurological effects were identified as the target organ for 6 chemicals. Therefore, the apportioned SCTLs for these chemicals are the non-apportioned values divided by 6. Note that the non-apportioned SCTLs for phenol, barium, cadmium, copper, nickel, vanadium, and cyanide are based on acute toxicity considerations.
11 According to the proposed Florida Rule 62-780, a chemical is identified as a COC if the maximum concentration is greater than 3 times the non-apportioned SCTL.
12 A chemical is selected as a COPC if the maximum detected concentration exceeds either the USEPA or Florida **apportioned** risk-based screening levels, or is greater than 3 times the non-apportioned SCTL and if site concentrations exceed facility background levels (for metals).
13 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.
14 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum detected concentration did not exceed the applicable PRG or SCTL.

NA = Not applicable/not available.
sat = Soil saturation concentration.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC screening level

For Elimination as a COPC:
BKG = Within background levels.
BSL = Below COPC screening level
NUT = Essential nutrient.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

TABLE 12-13

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL>15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
67-64-1	ACETONE	0.21	0.21	780	N	2.7E-04	NA (6)	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	3.1	1.6	80	N	3.9E-02	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.063 J	0.063	280	N	2.3E-04	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	1.1	0.71	40	N	2.8E-02	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-55-9	4,4'-DDE	0.0055 J	0.0055	3.3	C	1.7E-03	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.021 J	0.011	3.3	C	6.4E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	11100	6770	72000	N	1.5E-01	NE (7)	No	maximum < SCTL
7440-38-2	ARSENIC	2 J	1.1	0.8	C	**2.5E+00**	no	No	(8)
7440-39-3	BARIUM	33.3 J	9.5	110	N	3.0E-01	NE	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.058	120	N	1.2E-03	NE	No	maximum < SCTL
7440-70-2	CALCIUM	141 J	141	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	39.7	39.7	210	C	1.9E-01	NE	No	maximum < SCTL
7440-48-4	COBALT	0.92 J	0.71	4700	N	2.0E-04	NE	No	maximum < SCTL
7440-50-8	COPPER	3 J	1.7	110	N	2.7E-02	NE	No	maximum < SCTL
7439-89-6	IRON	7610	3390	23000	N	3.3E-01	no	No	maximum < SCTL
7439-92-1	LEAD	14.5	5.2	400		3.6E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	300 J	82.8	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	15.5	7.6	1600	N	9.7E-03	no	No	maximum < SCTL
7439-97-6	MERCURY	0.1 J	0.059	3.4	N	2.9E-02	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	841 J	841	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	1.1 J	0.47	390	N	2.8E-03	NE	No	maximum < SCTL
7440-22-4	SILVER	0.57 J	0.34	390	N	1.5E-03	NE	No	maximum < SCTL
7440-23-5	SODIUM	25.6 J	17.1	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	39.9	18.7	15	N	**2.7E+00**	no	No	(8)
7440-66-6	ZINC	13.1	7	23000	N	5.7E-04	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.7 J	0.55	30	N	2.3E-02	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	**TRPH**	612	612	340	N	**1.8E+00**	NA	**Yes**	maximum > SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 12-13

FLORIDA LEVEL 1 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL>15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Residential SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 1 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

18SB2-15-17	18SB6-15-17
18SB2-20-22	18SB6-20-22
18SB4-15-17	18SB7-15-17
18SB4-25-27	18SB8-15-17
18SB4-35-37	18SB9-15-17
18SB4-40-42	

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COPC = Chemical of potential concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

TABLE 12-14

COMPARISON TO SOIL SATURATION LIMIT - SUBSURFACE SOIL > 15 FEET BGS
RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Frequency of Detection	Maximum Concentration (1)	Exposure Point Concentration (2)	Sample of Maximum Detection	Site above Background ?(3)	Soil Saturation Limit, Csat (4)
	Volatile Organics (mg/kg)						
67-64-1	ACETONE	6/11	0.21	0.21	18SB4-25-27	NA (5)	100000
	Semivolatile Organics (mg/kg)						
91-57-6	2-METHYLNAPHTHALENE	2/11	3.1	1.6	18SB4-15-17	NA	---
132-64-9	DIBENZOFURAN	1/11	0.063 J	0.063	18SB6-15-17	NA	210
91-20-3	NAPHTHALENE	2/11	1.1	0.71	18SB4-15-17	NA	220
	Pesticides PCBs (mg/kg)						
72-55-9	4,4'-DDE	1/11	0.0055 J	0.0055	18SB4-40-42	NA	---
50-29-3	4,4'-DDT	1/11	0.021 J	0.011	18SB4-40-42	NA	---
	Petroleum Hydrocarbons (mg/kg)						
TTNUS001	TRPH	9/11	612	612	18SB4-15-17	NA	---

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels. If the site data to background data comparisons determined that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COPC.

4 Soil Saturation Limits (CSAT), Table 8, Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

5 NA - Not Applicable. According to proposed Florida Rule 62-780 only natuarlly occurring (inorganic) constituents are considered in the background evaluation.

Associated Samples:

18SB1-10-12	18SB4-5-7	18SB6-10-12-D
18SB1-5-7	18SB7-5-7	18SB6-5-7
18SB2-10-12	18SB9-5-7	18SB8-10-12
18SB2-5-7	18SB10-5-7	18SB8-5-7
18SB4-10-12	18SB6-10-12	18SB8-5-7-D

TABLE 12-15

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL > 15 FEET BGS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)		Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments
	Volatile Organics (mg/kg)								
67-64-1	ACETONE	0.21	0.21	5500	N	3.8E-05	NA(6)	No	maximum < SCTL
	Semivolatile Organics (mg/kg)								
91-57-6	2-METHYLNAPHTHALENE	3.1	1.6	560	N	5.5E-03	NA	No	maximum < SCTL
132-64-9	DIBENZOFURAN	0.063 J	0.063	5000	N	1.3E-05	NA	No	maximum < SCTL
91-20-3	NAPHTHALENE	1.1	0.71	270	N	4.1E-03	NA	No	maximum < SCTL
	Pesticides PCBs (mg/kg)								
72-55-9	4,4'-DDE	0.0055 J	0.0055	13	C	4.2E-04	NA	No	maximum < SCTL
50-29-3	4,4'-DDT	0.021 J	0.011	13	C	1.6E-03	NA	No	maximum < SCTL
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	11100	6770	---	N	---	no	No	(8)
7440-38-2	ARSENIC	2 J	1.1	3.7	C	5.4E-01	no	No	maximum < SCTL
7440-39-3	BARIUM	33.3 J	9.5	87000	N	3.8E-04	NE (7)	No	maximum < SCTL
7440-41-7	BERYLLIUM	0.14 J	0.058	800	N	1.8E-04	NE	No	maximum < SCTL
7440-70-2	CALCIUM	141 J	141	---		---	NE	No	Essential Nutrient
7440-47-3	CHROMIUM	39.7	39.7	420	C	9.5E-02	NE	No	maximum < SCTL
7440-48-4	COBALT	0.92 J	0.71	110000	N	8.4E-06	NE	No	maximum < SCTL
7440-50-8	COPPER	3 J	1.7	76000	N	3.9E-05	NE	No	maximum < SCTL
7439-89-6	IRON	7610	3390	480000	N	1.6E-02	no	No	maximum < SCTL
7439-92-1	LEAD	14.5	5.2	920		1.6E-02	NE	No	maximum < SCTL
7439-95-4	MAGNESIUM	300 J	82.8	---		---	NE	No	Essential Nutrient
7439-96-5	MANGANESE	15.5	7.6	22000	N	7.0E-04	no	No	maximum < SCTL
7439-97-6	MERCURY	0.1 J	0.059	26	N	3.8E-03	NE	No	maximum < SCTL
7440-09-7	POTASSIUM	841 J	841	---		---	NE	No	Essential Nutrient
7782-49-2	SELENIUM	1.1 J	0.47	10000	N	1.1E-04	NE	No	maximum < SCTL
7440-22-4	SILVER	0.57 J	0.34	9100	N	6.3E-05	NE	No	maximum < SCTL
7440-23-5	SODIUM	25.6 J	17.1	---		---	NE	No	Essential Nutrient
7440-62-2	VANADIUM	39.9	18.7	7400	N	5.4E-03	no	No	maximum < SCTL
7440-66-6	ZINC	13.1	7	560000	N	2.3E-05	NE	No	maximum < SCTL
	Miscellaneous Parameter (mg/kg)								
57-12-5	CYANIDE	0.7 J	0.55	39000	N	1.8E-05	NA	No	maximum < SCTL
	Petroleum Hydrocarbons (mg/kg)								
TTNUS001	TRPH	612	612	2500	N	2.4E-01	NA	No	maximum < SCTL

Shaded cells indicate that the specified criterion or background level has been exceeded or that the chemical has been selected as a COPC.

TABLE 12-15

FLORIDA LEVEL 2 DIRECT CONTACT EVALUATION - SUBSURFACE SOIL > 15 FEET BGS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CAS No.	Parameter	Maximum Concentration (1)	Exposure Point Concentration (2)	Non-Apportioned Florida Industrial SCTL- Direct Contact (3)	Ratio (Maximum/Non-Apportioned Industrial SCTL) Is Ratio > 1 ?	Site above Background ?(4)	Is Chemical a Potential Level 2 COC ? (5)	Rationale/Comments

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the maximum detected concentration.

2 Exposure point concentrations (EPCs) are maximum concentrations or 95 % upper confidence limits (UCLs) on the arithmetic mean as determined by statistical tests and calculations performed by the USEPA's ProUCL software and presented in Appendix A.

3 Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Florida Department of Environmental Protection (FDEP), August 1999.

4 To determine whether metal concentrations were within background levels, soil concentrations were compared to facility-wide background levels using the data and methodology presented in Appendix A. If the site data to background data comparisons determine that the site concentrations of a constituent were not significantly different from background, that chemical was not selected as a potential COC.

5 A chemical is selected as a potential COC if the maximum concentration exceeds the non-apportioned SCTL and, for metals, if the site concentrations exceed background levels.

6 NA - Not Applicable. According to proposed Florida Rule 62-780 only naturally occurring (inorganic) constituents are considered in the background evaluation.

7 NE - Not Evaluated. Site data to background data comparisons were not performed for the purpose of identifying metals exceeding background concentrations if the maximum concentration did not exceed the applicable SCTL.

8 These metals are not known to be associated with past practices or processes at Site 18 and the concentrations in soil at the site are considered to be naturally occurring or representative of anthropogenic background levels. Therefore, these constituents are not selected as potential COCs for the site.

Associated Samples:

18SB2-15-17
18SB2-20-22
18SB4-15-17
18SB4-25-27
18SB4-35-37
18SB4-40-42
18SB6-15-17
18SB6-20-22
18SB7-15-17
18SB8-15-17
18SB9-15-17

Definitions:

C = Carcinogen.
CAS = Chemical abstract services.
COC = Chemical of Concern.
J = Estimated value.
N = Noncarcinogen.
NA = Not applicable/not available.

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Risk Assessment Re-Evaluation of Soils
for
Sites 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18

VOLUME II OF II - APPENDICES

Naval Air Station Whiting Field
Milton, Florida
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Contract Task Order 0079

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APPENDIX A

STATISTICAL ANALYSIS PROTOCOLS TO SUPPORT THE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT RE-EVALUATION OF SITES 9 THROUGH 18 AT NAVAL AIR STATION WHITING FIELD

APPENDIX A

STATISTICAL ANALYSIS PROTOCOLS TO SUPPORT THE HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT RE-EVALUATION OF SITES 9 THROUGH 18 AT NAVAL AIR STATION WHITING FIELD

Appendix A presents the statistical protocols used to support the human health and ecological risk assessments for Sites 9 through 18:

1) To conduct the site soil data to background soil data comparisons necessary to support the human health risk assessments (HHRAs) and the screening-level ecological risk assessments (SLERAs) for soils.

2) To calculate the exposure point concentrations (EPCs) evaluated in the HHRAs and SLERAs.

The existing risk assessments (1999 – 2000) were re-evaluated and updated to assure they are in compliance with current United States Navy, United States Environmental Protection Agency (USEPA), and State of Florida guidance/methods and, importantly, to update any risk assessment results that may impact risk management decisions for Sites 9 through 18.

1.0 DETERMINATION OF BACKGROUND SOIL DATA SET

Background concentrations are those that would exist in the absence of influence from site operations. As discussed in Attachment A, Navy policy (January 2004) stipulates that risks be calculated for site-related chemicals of potential concern (COPCs) only (i.e., risks should not be calculated for chemicals present at background concentrations). Thus, the differentiation between site-related and non-site-related chemicals (i.e., chemicals present at background concentrations) is important in risk assessment. The first step in this differentiation process is the determination of the appropriate background data set for a medium.

The background datasets for soils defined in the General Information Report (GIR) (ABB-ES, January 1998) were utilized to conduct the risk assessment re-evaluations for Sites 9 through 18 at Naval Air Station (NAS) Whiting Field. As described in the GIR, the background subsurface soil data set contains 14 samples. These samples represent three different soil types (Troup loamy sand, Lakeland sand, and Dothan/Lucy/Bonifay) that were grouped and defined as the background subsurface soil dataset in the original risk assessments. The subsurface soil samples were combined and defined as a single data set because they were all collected at depths of 5 to 7 and 10 to 12 feet below ground surface (bgs) and therefore would be less effected by the surface soil type and surface conditions. The surface soil dataset consists of 15 samples representing four different soil types (Troup loamy sand, Orangeburg sandy loam, Lakeland sand samples, and Dothan/Lucy/Bonifay). The background surface soil data set presented in each of the original site-specific risk assessments consisted of the background samples for Troup Loamy (eight samples) and background samples for any other soil type that was found at the respective site. Samples of the Troup Loamy soils were included in all of the site-specific background surface soil data sets because the Troup Loamy soil type is the predominant soil type at the NAS Whiting Field sites of concern (75 percent of the surficial area at Whiting Field is Troup Loamy soil.) For example, as presented in Table 1-2 of the GIR, Site 16 is identified as having two surface soil types (Troup Loamy and Lakeland). Therefore, the site-specific background surface soil dataset for Site 16 consisted of the eight samples from the Troup Loamy soil and the three samples from the Lakeland soil type. However, it was recommended that the site data to background data comparisons conducted for the risk assessment re-evaluations use a single background surface soil dataset that included all available background surface soil samples. For purposes of statistical testing, a single combined background surface soil dataset should be more robust than smaller datasets defined by soil type. The following paragraphs support the recommended approach based on geological and statistical analyses of the surface soil datasets.

During previous risk assessment activities, background soil samples collected at NAS Whiting Field were initially categorized by soil type as defined by the United States Department of Agriculture Soil Conservation Service (SCS). SCS descriptions are typically used to develop soil map units with estimated boundaries. Most map units are made up of one kind of soil; however, some are made up of two or more kinds. The mapped units are used primarily to aid in large- scale agriculture and general land use planning. The SCS states that, due to the small scale, these maps are not suitable for planning the management of a farm or field or for selecting a site for a road or building.

SCS soil types are determined based on factors such as observed slope steepness, length, and shape of the slopes; the sizes of streams and the general patterns of drainage; the types of native plants and crops; and the types of rocks present. The criteria used to define the SCS soil types have no direct relevance to the geochemistry of soils. Therefore, there is no reason to group the background surface soil samples collected at NAS Whiting Field by SCS soil type in subunits based on mapped soil types. Instead, they should be assessed as a group.

To further support the use of a single background surface soil dataset, probability plots for each inorganic parameter were constructed using all available background surface soil samples (i.e., samples from

Troup loamy, Lakeland, Orangeburg, and Dothan/Lucy/Bonifay). The analysis was conducted to compare the inorganic profile for the Lakeland, Dothan/Lucy/Bonifay, and Orangeburg soil types to that of the Troup Loamy soils, the predominant soil type at NAS Whiting Field. Visual inspection of the plots (Figures A-11-1 through A-11-24) indicate that, for most parameters, the inorganic profiles of the Lakeland, Orangeburg, and Dothan/Lucy/Bonifay do not differ substantially from the inorganic profile of the Troup Loamy soils. For some inorganics, the inorganic profile of the Lakeland and Orangeburg soils may differ. However, the limited sample sizes of some of the individual soil types increases the uncertainty in this evaluation. The site soil to background soil comparisons were conducted on the combined background surface soil dataset; however, the critical risk drivers were further evaluated on a case-by-case basis to ensure that the use of a single, combined surface soil background dataset does not result in the incorrect selection or deletion of an inorganic chemical as a COPC.

2.0 METHODOLOGY FOR THE COMPARISON OF BACKGROUND SOIL AND SITE SOIL DATASETS

Site soil data to background soil data comparisons were conducted to determine which chemicals are present at concentrations that are elevated relative to background conditions. The background datasets, as defined above and in GIR Sections 3.3.1.1 and 3.3.1.2 for surface and subsurface soil, respectively, contain at least 14 samples. Assuming that the site dataset is of sufficient size, statistical tests (described below) were used to compare the site data to the background data for purposes of determining if a chemical is present at concentrations exceeding background (i.e., the background datasets are large enough to allow formal, statistical testing). The methodology is in compliance with the following guidance documents:

- Guidance for Data Quality Assessment (USEPA, July 2000).
- Guidance for Environmental Background Analysis Volume 1: Soil (NFESC, April 2002).

The following approach was used for the initial comparison of background and site soil datasets:

- Graphical representations of the data (i.e., probability plots and box and whisker plots) were utilized to allow a visual comparison of site and background data. All comparisons were on an analyte-to-analyte comparison level. These comparisons allowed an initial understanding as to whether the site concentrations were elevated relative to the background concentrations. If the site data were clearly less than the existing background data, no further statistical analysis is warranted, and it was concluded that site data are within background levels. If the site concentrations were clearly greater than the existing background concentrations, no further statistical analysis were warranted, and it was concluded that site concentrations are greater than background. The statistical tests described below were used to conduct the dataset–to-dataset comparisons when it is not clear that site chemical concentrations exceed/do not exceed background concentrations.

- Evaluations based on frequency of detections were also be used to initially define the site and background datasets before any statistics were conducted. If a background dataset contained all non-detects and the site had a detection(s), the analyte was classified as "site above background levels" for that analyte. If all site results were non-detects, it was concluded that site data were within background levels. This evaluation considered the magnitude of the sample quantitation limits (SQLs) reported for non-detect results.

- Datasets with four samples or less were analyzed by graphical methods as well as threshold comparison to the SQLs. However, they could not be analyzed by the statistical methodology described below.

The statistical tests (parametric and non-parametric analyses) described below were used to compare site and background soil datasets. These tests are among those recommended to test the hypothesis that site concentrations are not significantly higher than background concentrations (or, alternatively, that there is a difference between the site and background datasets). All are presented in the aforementioned guidance documents. Each has a set of assumptions that must be met for the results of the statistical test to be valid. Thus, assumption testing is conducted before hypothesis testing. The statistical tests presented below are listed from most rigorous to least rigorous. The more rigorous tests give the more robust results when the assumptions inherent in the tests are met. When these assumptions are not met, a less rigorous test will actually provide more accurate results. The recommendation is to use the most rigorous test for which all assumptions are met.

Parametric Analysis of Variance (ANOVA) – The parametric ANOVA tests the hypothesis that the mean concentration of the site dataset is indistinguishable from the mean concentration of the background dataset. It is the most rigorous statistical test recommended in this section and consequently, the assumption testing that must precede this test is also rigorous, as follows:

- The underlying probability distribution function (PDF) of the site and background datasets must be the same (e.g., both normal or both lognormal). The Shapiro-Wilk Test for Normality (or similar test) is used to determine if the distribution of a dataset is compatible with an assumed normal or lognormal distribution. However, this test requires at least three samples; consequently, the parametric ANOVA also requires a minimum of three samples in both the site and background datasets.

- Fifty percent or more of the results in both the background and site datasets must be analytical detections [i.e., no more that 50 percent of the datasets may represent non-detect ("U"-qualified) results].

- The site and background datasets must have equal variances. The Levene's Test of Homogeneity of Variance (HOV) may be used to test this assumption. If the preceding two conditions are met, but the site and background datasets have unequal variances, the Satterthwaite's t test may be used to test the hypothesis that the site mean concentration is not significantly greater than the background mean concentration.

Wilcoxon Rank-Sum Test (a non-parametric test) – The Wilcoxon Rank-Sum Test ranks analytical results in the combined site and background data from least to greatest concentration. In theory, if the average rank of the site data exceeds the average rank of the background data, the site concentrations exceed background concentrations. The assumption testing for the Wilcoxon Rank Sum Test is somewhat less rigorous than that specified for the parametric ANOVA:

- Fifty percent or more of the results in both the background and site datasets must be analytical detections [i.e., no more that 50 percent of the datasets may represent non-detect ("U"-qualified) results].

- The combined site and background dataset should have at least 12 analytical results. Also, the site and background data set must each have at least three analytical results. If the site and background datasets each have at least 50 percent detected results and at least three analytical results, but the combined data set has fewer than 12 analytical results, the "critical values" of the test may be reduced to the highest obtainable value for the smaller combined dataset. The minimum dataset requirements are three site values and three background values.

Test of Proportions – If 50 percent of the combined site and background measurements are reported as non-detect results, it is difficult to conduct a valid statistical test of whether the site average (mean or median) is shifted to higher concentrations relative to the background site average (mean or median). The parametric ANOVA and Wilcoxon Rank-Sum tests are not recommended in these cases, and a less rigorous statistical test such as the two-sample Test of Proportions is more suitable. In theory, if a larger proportion of the site dataset than the background data set has concentrations greater than a specified concentration "C", it is concluded that site concentrations exceed background concentrations. Typically, "C" is just slightly greater than the largest non-detect value. There is no assumption testing required for the test of proportions. However, the statistical "power" of the test decreases and the probability of errors (false positives and false negatives) increases as the size of the site and background datasets decrease.

With the exception of the Test of Proportions, all of the statistical tests presented above focus on the comparison of the central tendency characteristics of the site dataset versus the central tendency characteristics of the background dataset. Consequently, the tests are not sensitive to whether a few extreme values in the site dataset may exceed background levels. The Quantile Test (or similar test) does focus on extreme values within a site data set and should be conducted in conjunction with the parametric ANOVA, Wilcoxon-Rank Sum, and Test of Proportions whenever possible. In theory, if the higher concentrations in the combined site/background dataset tend to be from the site dataset, it is concluded the site concentrations exceed the background concentrations. The Quantile Test focuses on the comparison of the "right tail" of the site dataset to the "right tail" of the background dataset. The assumption testing for the Quantile Test is less rigorous than that specified for the parametric ANOVA or the Wilcoxon Rank-Sum Test. The sole assumption is as follows:

- The site and background datasets must each have at least 10 analytical results.

The results of the background evaluations are presented in the following subsections. The reader should note that the ***conclusions*** of the evaluations are presented in the chemical of potential concern selection tables of the risk assessments. The conclusions are based on a review of the graphical presentations, the data set to data set comparisons, and consultations with the project geologists.

Section 3.0 Methodology for Exposure Point Concentration Calculations

The EPC is an estimation of the concentration of a chemical in an environmental medium to which a receptor is exposed. It is often a conservative estimate of the average chemical concentration in an environmental medium [e.g., the 95-percent upper confidence limit (UCL) on the arithmetic mean.] Methodology recommended in the following guidance document:

- Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (USEPA, December 2002).

was used to calculate EPCs for COPCs selected for HHRA and SLERA evaluations.

Pro UCL, a statistical software package developed by a contractor to the USEPA (Lockheed Martin) was used to perform the EPC calculations. However, the Navy is aware of a similar statistical software package under development by the University of Florida for the Florida Department of Environmental Protection (FDEP). This software was not used to calculate EPCs because it was not available at the time the EPC calculations for this project were performed. The software may be used in the future however, if the Navy concurs with the statistical methodology recommended by FDEP.

Additional details regarding the calculation of the EPCs are presented in the site-specific risk assessments (e.g., the determination of the exposure unit and the selection of the dataset used to represent the exposure unit). Sample and duplicate analytical results were averaged prior to the calculation of the EPC. Data values reported as non-detect results were substituted with one-half the sample quantitation limit (SQL) prior to the calculation of the EPC. If the dataset used to calculate the EPC contained fewer than 10 samples, the EPC was defined as the maximum detected concentration. If the calculated EPC exceeded the maximum detected concentration, the EPC was defined as the maximum detected concentration.

APPENDIX A.1

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 09, WASTE FUEL DISPOSAL PIT

APPENDIX TABLE A-1-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 09, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0009	0009	0009	0009	0009	0009	0009
LOCATION	09-S001	09-S002	09-S003	09-S003	09-S003	09-S004	09-S005
NSAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301-D	09S00401	09S00501
SAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301D	09S00401	09S00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
1,2-DICHLOROPROPANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
2-BUTANONE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
2-HEXANONE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
4-METHYL-2-PENTANONE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
ACETONE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
BENZENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
BROMODICHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
BROMOFORM	11 U	11 U	12 U	12 U	12 U	14 U	12 U
BROMOMETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CARBON DISULFIDE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CARBON TETRACHLORIDE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CHLOROBENZENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CHLORODIBROMOMETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CHLOROETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CHLOROFORM	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
ETHYLBENZENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
METHYLENE CHLORIDE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
STYRENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TETRACHLOROETHENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TOLUENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TOTAL XYLENES	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
TRICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
VINYL CHLORIDE	11 U	11 U	12 U	12 U	12 U	14 U	12 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	110 J
1,2-DICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
1,3-DICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
1,4-DICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	120
2,4,5-TRICHLOROPHENOL	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U

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SITE 09, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0009	0009	0009	0009	0009	0009	0009
LOCATION	09-S001	09-S002	09-S003	09-S003	09-S003	09-S004	09-S005
NSAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301-D	09S00401	09S00501
SAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301D	09S00401	09S00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2,4-DICHLOROPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2,4-DIMETHYLPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2,4-DINITROPHENOL	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
2,4-DINITROTOLUENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2,6-DINITROTOLUENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2-CHLORONAPHTHALENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2-CHLOROPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2-METHYLNAPHTHALENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2-METHYLPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
2-NITROANILINE	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
2-NITROPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
3,3'-DICHLOROBENZIDINE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
3-NITROANILINE	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	380 U	370 U	360 U	470 U	400 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
4-CHLOROANILINE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
4-METHYLPHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
4-NITROANILINE	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
4-NITROPHENOL	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
ACENAPHTHENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
ACENAPHTHYLENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
ANTHRACENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BENZO(A)ANTHRACENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BENZO(A)PYRENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BENZO(B)FLUORANTHENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BENZO(G,H,I)PERYLENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BENZO(K)FLUORANTHENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
BUTYL BENZYL PHTHALATE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
CHRYSENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
DI-N-BUTYL PHTHALATE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
DI-N-OCTYL PHTHALATE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
DIBENZOFURAN	370 U	370 U	380 U	370 U	360 U	470 U	400 U
DIETHYL PHTHALATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	470 UJ	400 UJ
DIMETHYL PHTHALATE	370 U	370 U	380 U	370 U	360 U	470 U	400 U

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NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0009	0009	0009	0009	0009	0009	0009
LOCATION	09-S001	09-S002	09-S003	09-S003	09-S003	09-S004	09-S005
NSAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301-D	09S00401	09S00501
SAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301D	09S00401	09S00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
FLUORENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
HEXACHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
HEXACHLOROBUTADIENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
HEXACHLOROETHANE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
ISOPHORONE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
N-NITROSODIPHENYLAMINE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
NAPHTHALENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
NITROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
PENTACHLOROPHENOL	940 U	920 U	960 U	930 U	900 U	1200 U	1000 U
PHENANTHRENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
PHENOL	370 U	370 U	380 U	370 U	360 U	470 U	400 U
PYRENE	370 U	370 U	380 U	370 U	360 U	470 U	400 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
4,4'-DDE	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
4,4'-DDT	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
ALDRIN	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
ALPHA-BHC	1.9 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2.4 UJ	2.1 UJ
ALPHA-CHLORDANE	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
AROCLOR-1016	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
AROCLOR-1221	76 U	77 U	81 U	80 U	79 U	96 U	82 U
AROCLOR-1232	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
AROCLOR-1242	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
AROCLOR-1248	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
AROCLOR-1254	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
AROCLOR-1260	37 U	38 U	40 U	39.5 U	39 U	47 U	40 U
BETA-BHC	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
DELTA-BHC	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
DIELDRIN	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
ENDOSULFAN I	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
ENDOSULFAN II	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
ENDOSULFAN SULFATE	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
ENDRIN	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
ENDRIN KETONE	3.7 U	3.8 U	4 U	3.95 U	3.9 U	4.7 U	4 U
GAMMA-BHC (LINDANE)	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
GAMMA-CHLORDANE	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U

APPENDIX TABLE A-1-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 09, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0009	0009	0009	0009	0009	0009	0009
LOCATION	09-S001	09-S002	09-S003	09-S003	09-S003	09-S004	09-S005
NSAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301-D	09S00401	09S00501
SAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301D	09S00401	09S00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
HEPTACHLOR EPOXIDE	1.9 U	2 U	2 U	2 U	2 U	2.4 U	2.1 U
METHOXYCHLOR	19 U	20 U	20 U	20 U	20 U	24 U	21 U
TOXAPHENE	190 U	200 U	200 U	200 U	200 U	240 U	210 U
Inorganics (mg/kg)							
ALUMINUM	25800	17500	25200	29150	33100	29300	40 U
ANTIMONY	12 UJ	8.3 J	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	10.1	4.1	8.5	7.8	7.1	10.1	2.8
BARIUM	7.5 J	5.5 J	8.9 J	15.3 J	21.7 J	11.7 J	40 U
BERYLLIUM	0.11 J	0.08 J	0.12 J	0.17 J	0.22 J	0.14 J	1 U
CADMIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CALCIUM	1000 UJ	1000 UJ	1000 UJ	384 J	384 J	1000 UJ	1000 U
CHROMIUM	46.2	14.9	21.7	25.6	29.5	31.4	2 U
COBALT	10 U	10 U	0.52 J	0.535 J	0.55 J	10 U	10 U
COPPER	6.6	4.5 J	5 U	5.75	9	7.5	5 U
IRON	29800	12300	17800	22150	26500	23900	20 U
LEAD	4.5	6.8	11.2	8.9	6.6	12.3	3.1
MAGNESIUM	104 J	73.3 J	143 J	185 J	227 J	147 J	1000 U
MANGANESE	10.1 J	21 J	28.2 J	40.55 J	52.9 J	22.2 J	3 UJ
MERCURY	0.01 J	0.01 J	0.01 J	0.01 J	0.01 J	0.03 J	0.1 U
NICKEL	3.9 J	2.9 J	8 UJ	6.1 J	6.1 J	8 UJ	8 UJ
POTASSIUM	1000 U	1000 U	1000 U	212 J	212 J	1000 U	1000 U
SELENIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 UJ
SILVER	2 U	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
THALLIUM	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	76.7	32.2	43.5	54.3	65.1	64.7	10 U
ZINC	4 UJ	3.8 J	6.3	10.35	14.4	6.9	4 U
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	4.5 U	4.6 U	4.7 U	4.7 U	4.7 U	5.9 U	5.7 U

APPENDIX TABLE A-1-2
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 09, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0009	0009	0009	0009	0009	0009	0009
LOCATION	09-S001	09-S002	09-S003	09-S003	09-S003	09-S004	09-S005
NSAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301-D	09S00401	09S00501
SAMPLE	09S00101	09S00201	09S00301	09S00301-AVG	09S00301D	09S00401	09S00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLEDATE	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995	12/6/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	110 J
1,4-DICHLOROBENZENE	370 U	370 U	380 U	370 U	360 U	470 U	120
Inorganics (mg/kg)							
ALUMINUM	25800	17500	25200	29150	33100	29300	40 U
ANTIMONY	12 UJ	8.3 J	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	10.1	4.1	8.5	7.8	7.1	10.1	2.8
BARIUM	7.5 J	5.5 J	8.9 J	15.3 J	21.7 J	11.7 J	40 U
BERYLLIUM	0.11 J	0.08 J	0.12 J	0.17 J	0.22 J	0.14 J	1 U
CALCIUM	1000 UJ	1000 UJ	1000 UJ	384 J	384 J	1000 UJ	1000 U
CHROMIUM	46.2	14.9	21.7	25.6	29.5	31.4	2 U
COBALT	10 U	10 U	0.52 J	0.535 J	0.55 J	10 U	10 U
COPPER	6.6	4.5 J	5 U	5.75	9	7.5	5 U
IRON	29800	12300	17800	22150	26500	23900	20 U
LEAD	4.5	6.8	11.2	8.9	6.6	12.3	3.1
MAGNESIUM	104 J	73.3 J	143 J	185 J	227 J	147 J	1000 U
MANGANESE	10.1 J	21 J	28.2 J	40.55 J	52.9 J	22.2 J	3 UJ
MERCURY	0.01 J	0.01 J	0.01 J	0.01 J	0.01 J	0.03 J	0.1 U
NICKEL	3.9 J	2.9 J	8 UJ	6.1 J	6.1 J	8 UJ	8 UJ
POTASSIUM	1000 U	1000 U	1000 U	212 J	212 J	1000 U	1000 U
VANADIUM	76.7	32.2	43.5	54.3	65.1	64.7	10 U
ZINC	4 UJ	3.8 J	6.3	10.35	14.4	6.9	4 U

APPENDIX TABLE A-1-3
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	1/5	110 J	110 J	360 - 470	180	110	09S00501
1,4-DICHLOROBENZENE	1/5	120	120	360 - 470	182	120	09S00501
Inorganics (mg/kg)							
ALUMINUM	4/5	17500	33100	40	20354	25438	09S00301-D
ANTIMONY	1/5	8.3 J	8.3 J	12	6.46	8.30	09S00201
ARSENIC	5/5	2.8	10.1	---	6.98	6.98	09S00101, 09S00401
BARIUM	4/5	5.5 J	21.7 J	40	12.0	10.0	09S00301-D
BERYLLIUM	4/5	0.08 J	0.22 J	1	0.200	0.125	09S00301-D
CALCIUM	1/5	384 J	384 J	1000	477	384	09S00301-D
CHROMIUM	4/5	14.9	46.2	2	23.8	29.5	09S00101
COBALT	1/5	0.52 J	0.55 J	10	4.11	0.535	09S00301-D
COPPER	4/5	4.5 J	9	5	5.37	6.09	09S00301-D
IRON	4/5	12300	29800	20	17632	22038	09S00101
LEAD	5/5	3.1	12.3	---	7.12	7.12	09S00401
MAGNESIUM	4/5	73.3 J	227 J	1000	202	127	09S00301-D
MANGANESE	4/5	10.1 J	52.9 J	3	19.1	23.5	09S00301-D
MERCURY	4/5	0.01 J	0.03 J	0.1	0.0220	0.0150	09S00401
NICKEL	3/5	2.9 J	6.1 J	8	4.18	4.30	09S00301-D
POTASSIUM	1/5	212 J	212 J	1000	442	212	09S00301-D
VANADIUM	4/5	32.2	76.7	10	46.6	57.0	09S00101
ZINC	3/5	3.8 J	14.4	4	5.01	7.02	09S00301-D

APPENDIX TABLE A-1-4
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics						Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
1,2,4-TRICHLOROBENZENE	**5**	**1**	**180**	**110**	**44.7**	**-0.821**	**Data are Normal (0.05)**	**223**	**Student-t**	**UCL > Max Detect**
1,4-DICHLOROBENZENE	**5**	**1**	**182**	**120**	**40.9**	**-0.546**	**Data are Normal (0.05)**	**221**	**Student-t**	**UCL > Max Detect**
ALUMINUM	5	4	20354	25438	12336	-1.526	Data are Normal (0.05)	32115	Student-t	UCL > Max Detect
ANTIMONY	**5**	**1**	**6.46**	**8.30**	**1.03**	**2.24**	**Data are Non-parametric (0.05)**	**7.44**	**Student-t or Modified-t UCL**	**Max ND > UCL**
ARSENIC	5	5	6.98	6.98	3.39	-0.382	Data are Normal (0.05)	10.2	Student-t	UCL > Max Detect
BARIUM	5	4	12.0	10.0	5.86	0.377	Data are Normal (0.05)	17.6	Student-t	UCL > Max Detect
BERYLLIUM	5	4	0.200	0.125	0.171	2.02	Data Follow Gamma Distribution (0.05)	0.483	Approximate Gamma 95% UCL	UCL > Max Detect
CALCIUM	**5**	**1**	**477**	**384**	**51.9**	**-2.236**	**Data Follow Gamma Distribution (0.05)**	**539**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
CHROMIUM	5	4	23.8	29.5	17.0	-0.079	Data are Normal (0.05)	40.1	Student-t	- -
COBALT	**5**	**1**	**4.11**	**0.535**	**2.00**	**-2.236**	**Data Follow Gamma Distribution (0.05)**	**10.5**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
COPPER	5	4	5.37	6.09	1.95	-0.716	Data are Normal (0.05)	7.23	Student-t	- -
IRON	5	4	17632	22038	11691	-0.908	Data are Normal (0.05)	28778	Student-t	- -
LEAD	5	5	7.12	7.12	3.64	0.531	Data are Normal (0.05)	10.6	Student-t	- -
MAGNESIUM	5	4	202	127	172	1.91	Data are Normal (0.05)	366	Student-t	UCL > Max Detect
MANGANESE	5	4	19.1	23.5	14.7	0.499	Data are Normal (0.05)	33.1	Student-t	- -
MERCURY	5	4	0.022	0.015	0.018	1.26	Data are Normal (0.05)	0.039	Student-t	UCL > Max Detect
NICKEL	**5**	**3**	**4.18**	**4.30**	**1.17**	**1.29**	**Data are Normal (0.05)**	**5.29**	**Student-t**	**Max ND > UCL**
POTASSIUM	**5**	**1**	**442**	**212**	**129**	**-2.236**	**Data Follow Gamma Distribution (0.05)**	**658**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
VANADIUM	5	4	46.6	57.0	28.4	-0.746	Data are Normal (0.05)	73.7	Student-t	- -
ZINC	**5**	**3**	**5.01**	**7.02**	**3.59**	**0.922**	**Data are Normal (0.05)**	**8.44**	**Student-t**	**- -**

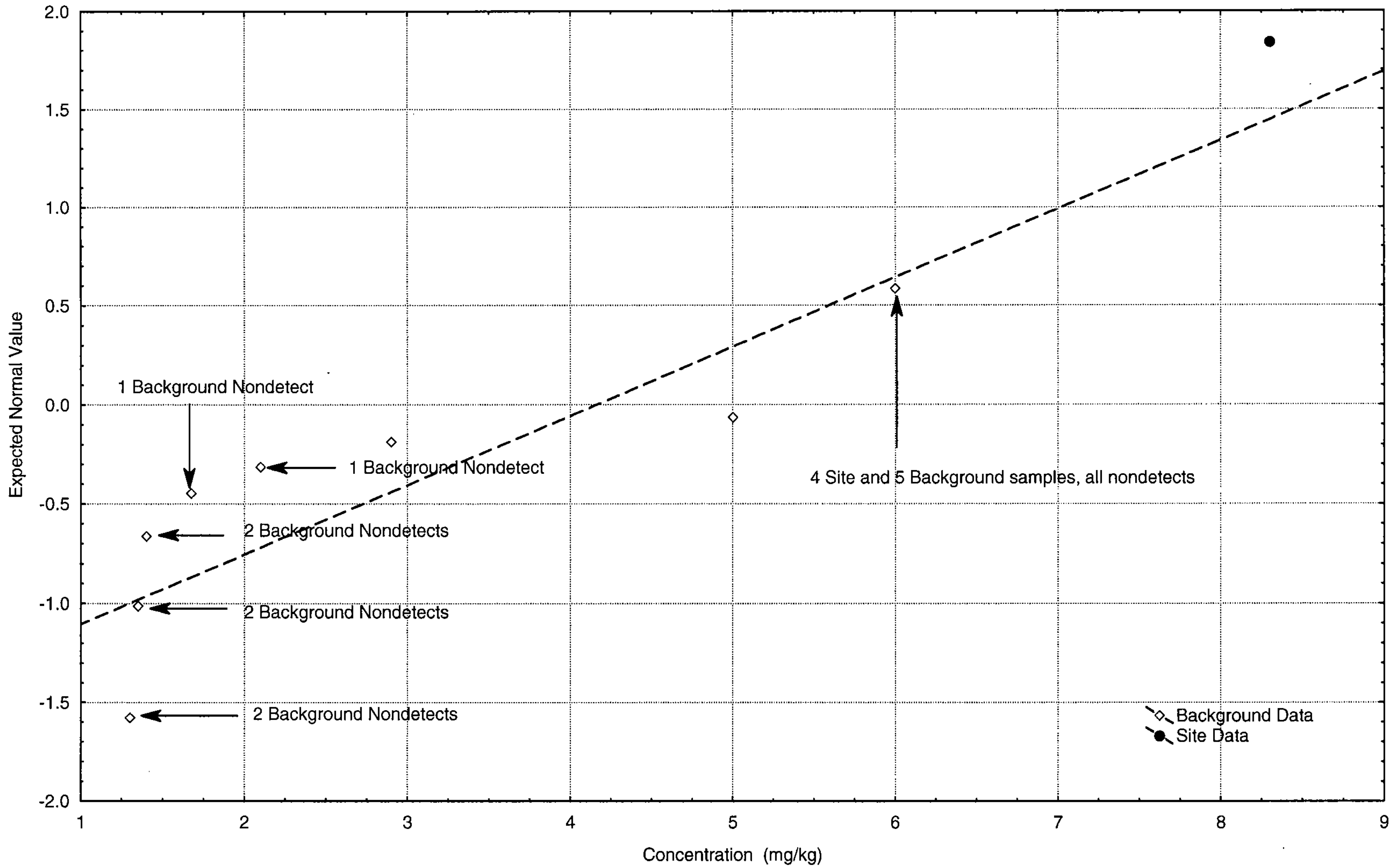
Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
1/2 the detection limit was used for B qualified data.

Associated Samples
09S00101
09S00201
09S00301-AVG
09S00401
09S00501

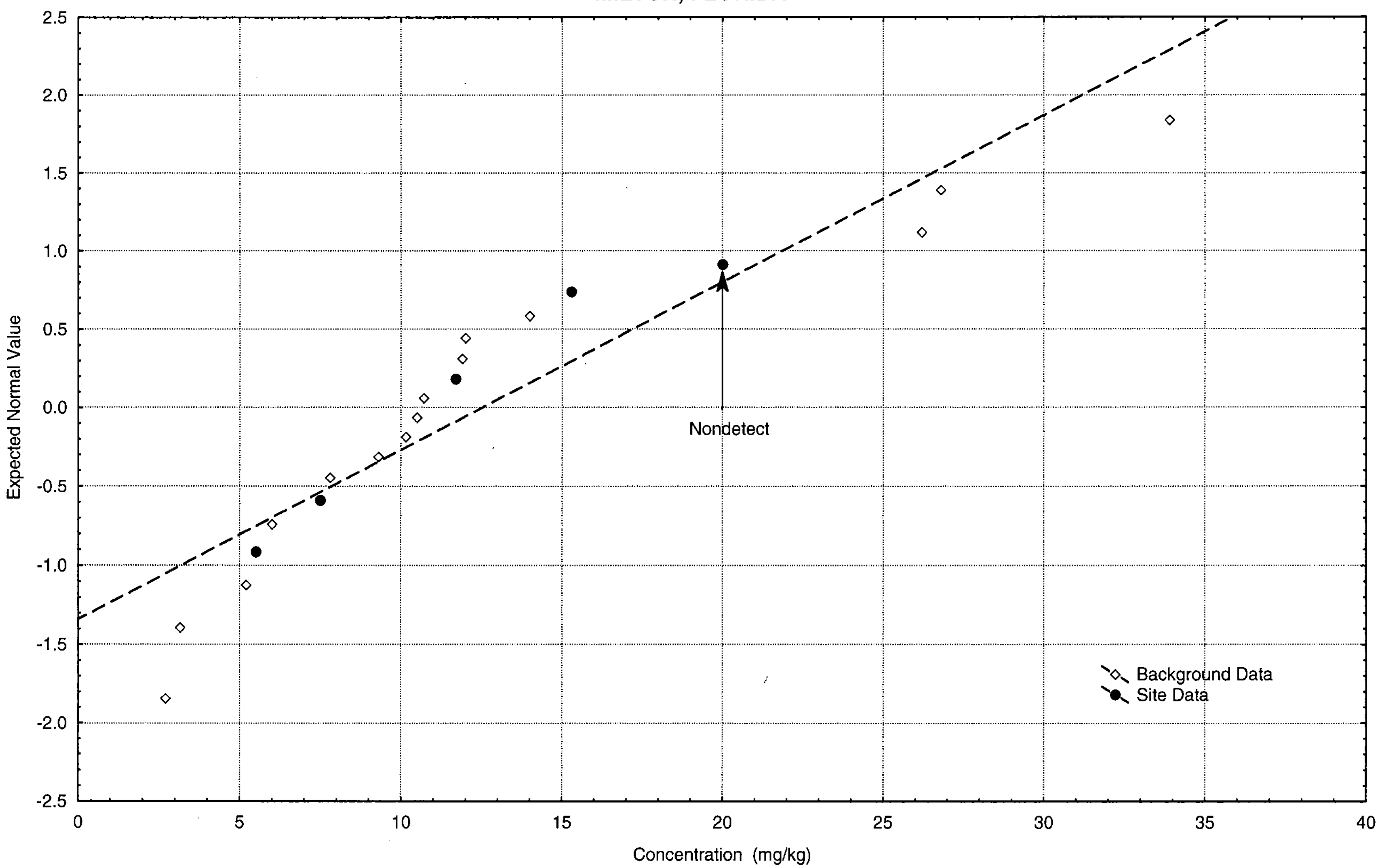
APPENDIX TABLE A-1-5
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 9 SURFACE SOIL																			
CHROMIUM	4/5	15/15	19/20	5%	PASS	46.2	16.3	23.8	6.12	NORMAL	LOGNORMAL	**FAIL**	---	WRS	1.79	0.0734	**YES**	---	**YES**
LEAD	5/5	15/15	20/20	0%	PASS	12.3	9.8 J	7.12	5.49	LOGNORMAL	NORMAL	**FAIL**	---	WRS	0.917	0.359	NO	PASS	NO

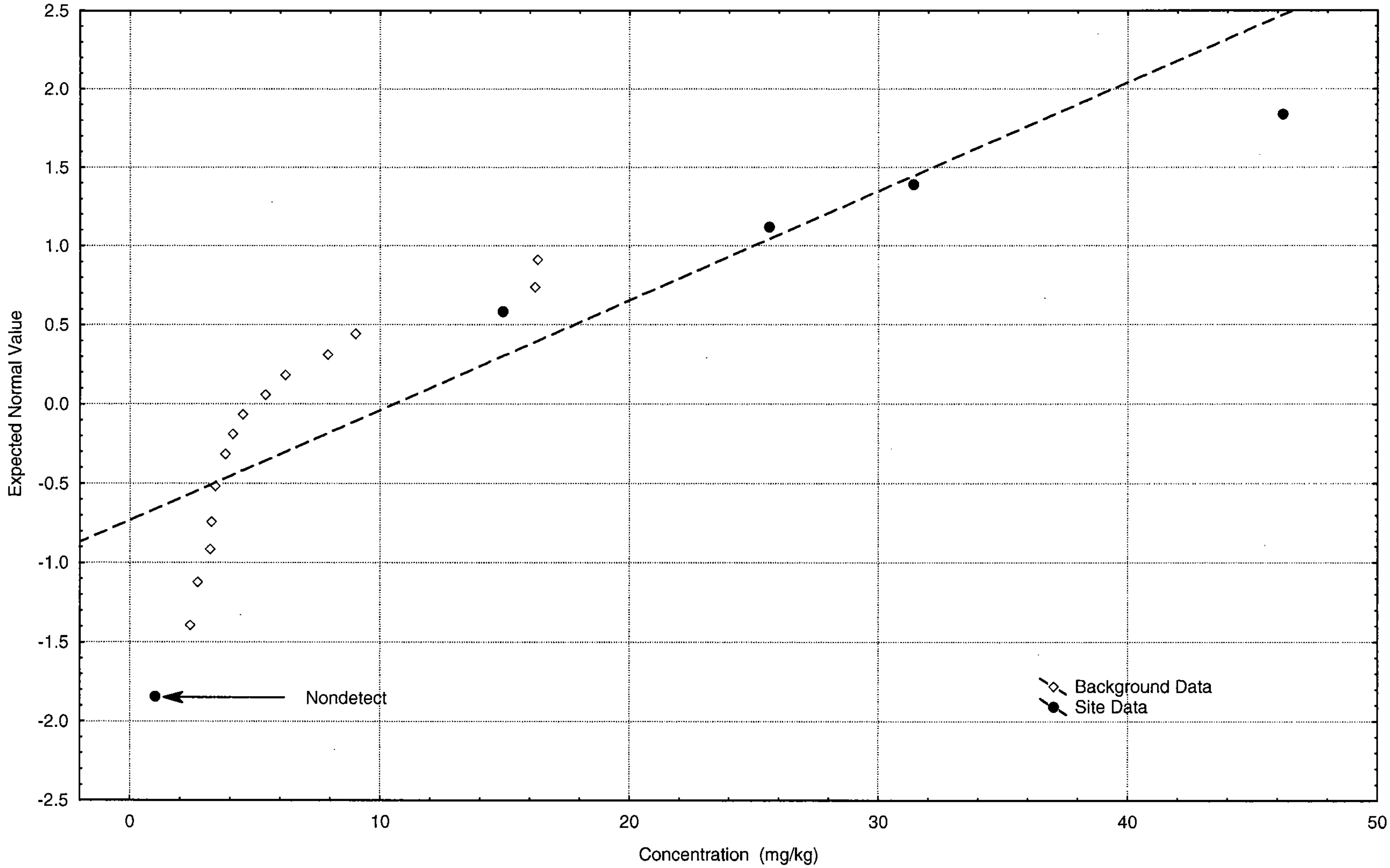
APPENDIX FIGURE A-1-1
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



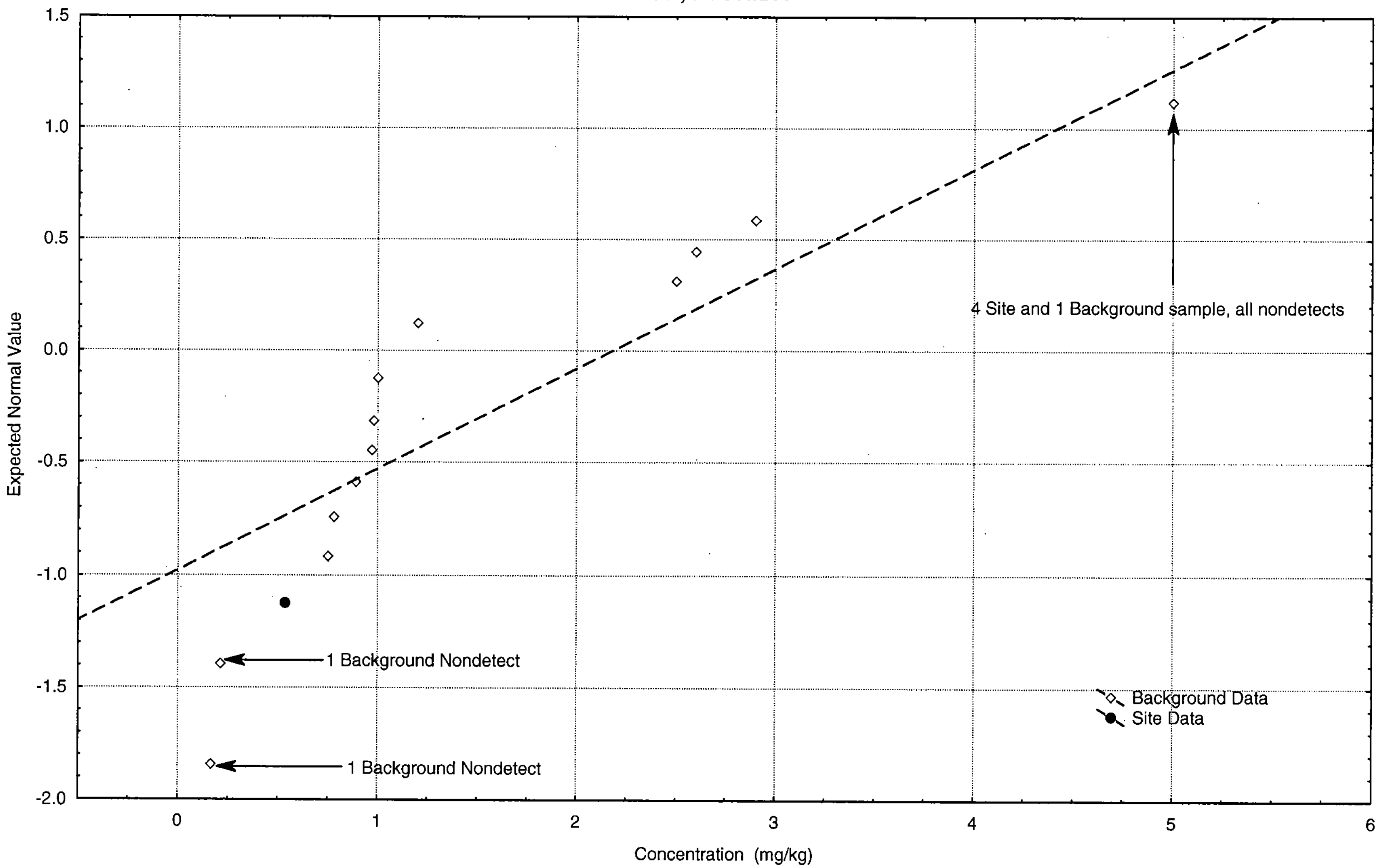
APPENDIX FIGURE A-1-2
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



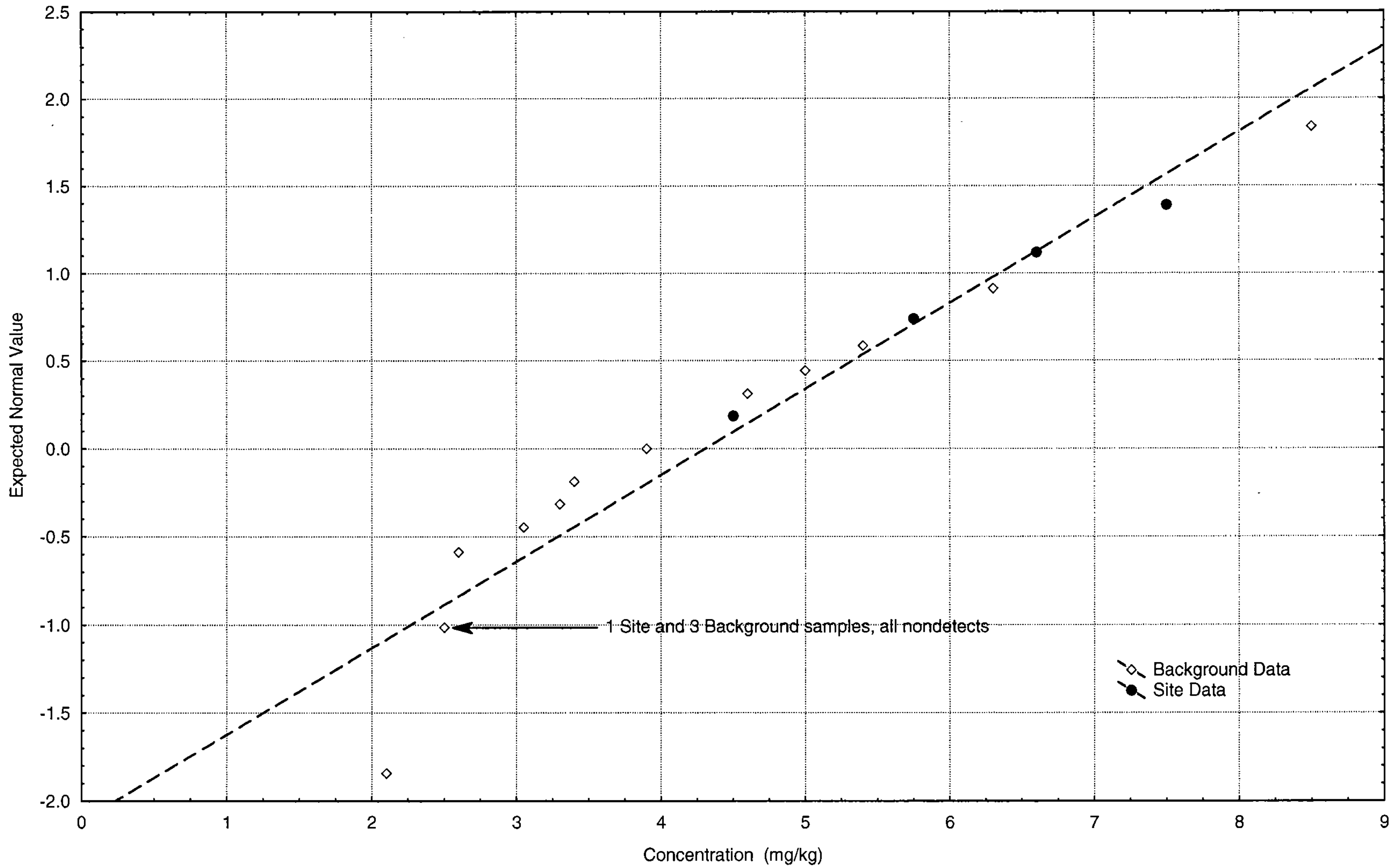
APPENDIX FIGURE A-1-3
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



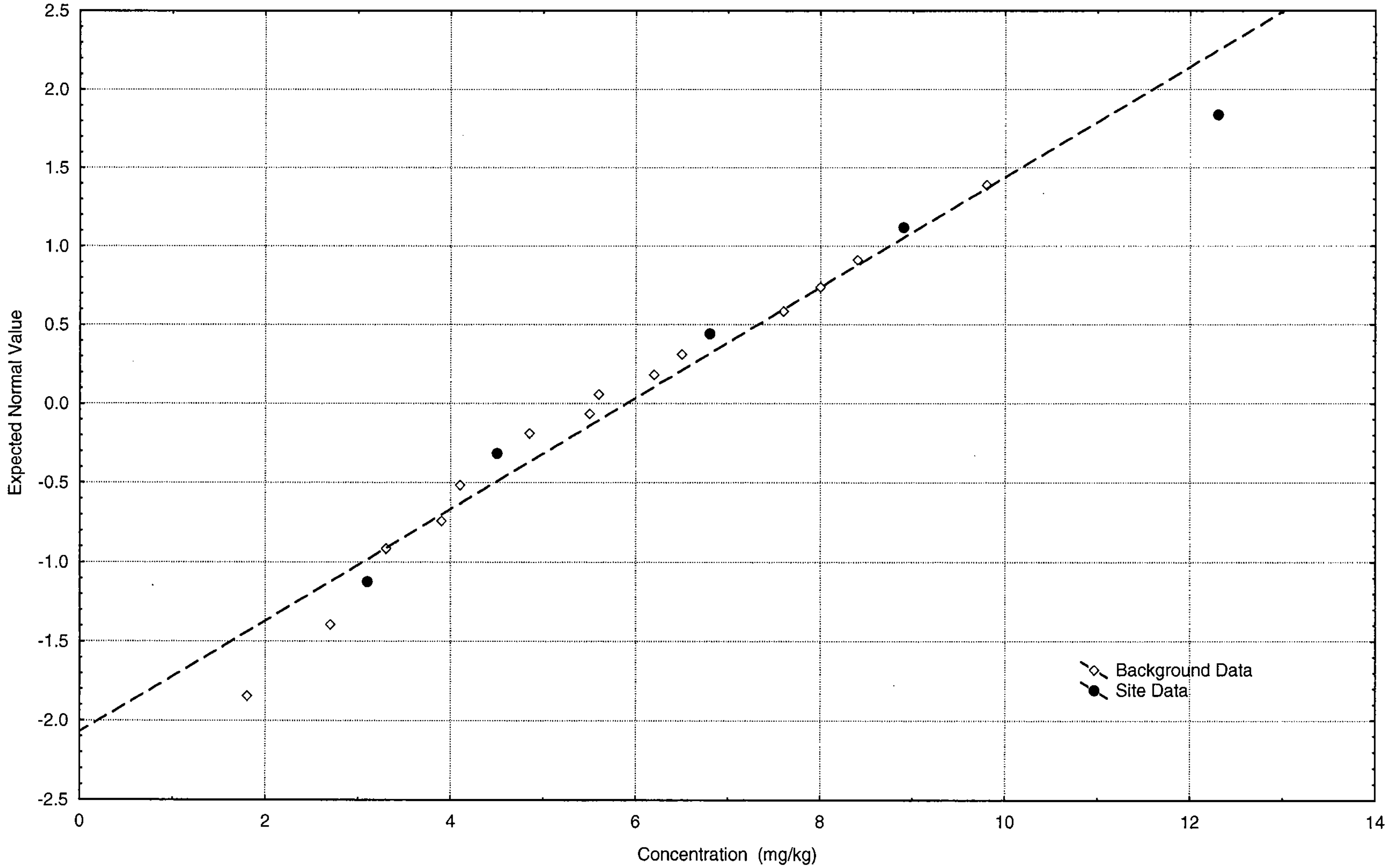
APPENDIX FIGURE A-1-4
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-1-5
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-1-6
NORMAL PROBABILITY PLOT - LEAD - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.2

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002	10-S003
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D	10S00301
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D	10S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 UJ
1,1,2-TRICHLOROETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
1,1-DICHLOROETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
1,1-DICHLOROETHENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
1,2-DICHLOROETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
1,2-DICHLOROPROPANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
2-BUTANONE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11.5 UJ	12 UJ	11 U
2-HEXANONE	11 UJ	12 UJ	11 UJ	11 U	11 UJ	11 U	11 U	11 U	11 UJ	4 J	4 J	11 UJ
4-METHYL-2-PENTANONE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11.5 UJ	12 UJ	11 U
ACETONE	11 UJ	12 UJ	11 UJ	11 U	11 UJ	11 U	11 U	11 U	29 UJ	24.5 UJ	20 UJ	11 U
BENZENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
BROMODICHLOROMETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
BROMOFORM	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
BROMOMETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CARBON DISULFIDE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CARBON TETRACHLORIDE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CHLOROBENZENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CHLORODIBROMOMETHANE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CHLOROFORM	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CHLOROMETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
ETHYLBENZENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
METHYLENE CHLORIDE	10 UJ	11 UJ	5 UJ	6 UJ	8 UJ	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
STYRENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TETRACHLOROETHENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TOLUENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TOTAL XYLENES	6 U	6 U	5 U	1 J	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
TRICHLOROETHENE	6 U	6 U	5 U	6 U	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 UJ
VINYL ACETATE	11 U	12 U	11 U	11 U	11 U							
VINYL CHLORIDE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
1,2-DICHLOROBENZENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
1,3-DICHLOROBENZENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
1,4-DICHLOROBENZENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002	10-S003
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D	10S00301
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D	10S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
2,4,6-TRICHLOROPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2,4-DICHLOROPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2,4-DIMETHYLPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2,4-DINITROPHENOL	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
2,4-DINITROTOLUENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2,6-DINITROTOLUENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2-CHLORONAPHTHALENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2-CHLOROPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2-METHYLNAPHTHALENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2-METHYLPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
2-NITROANILINE	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
2-NITROPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
3,3'-DICHLOROBENZIDINE	740 U	730 U	710 U	700 U	770 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
3-NITROANILINE	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
4-CHLOROANILINE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
4-METHYLPHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
4-NITROANILINE	1800 UJ	1800 UJ	1700 UJ	1700 UJ	1900 UJ	920 U	910 U	900 U	950 U	960 U	970 U	950 U
4-NITROPHENOL	1800 U	1800 U	1700 U	1700 U	1900 U	920 U	910 U	900 U	950 U	960 U	970 U	950 U
ACENAPHTHENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	40 J	40 J	110 J
ACENAPHTHYLENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
ANTHRACENE	370 U	370 U	350 U	350 U	380 U	370 U	270 J	270 J	380 U	54 J	54 J	200 J
BENZO(A)ANTHRACENE	81 J	57 J	59 J	42 J	380 U	340	770	1200	87 J	138.5 J	190 J	490
BENZO(A)PYRENE	46 J	45 J	350 U	350 U	380 U	400	700	1000	95 J	122.5 J	150 J	350 J
BENZO(B)FLUORANTHENE	71 J	78 J	62 J	350 U	380 U	480	890	1300	150 J	175 J	200 J	530 J
BENZO(G,H,I)PERYLENE	370 U	370 U	350 U	350 U	380 U	180 J	260 J	340 J	380 U	380 U	380 U	380 UJ
BENZO(K)FLUORANTHENE	76 J	74 J	62 J	350 U	380 U	360 J	630 J	900	110 J	160 J	210 J	420 J
BENZOIC ACID	1800 U	1800 U	1700 U	1700 U	1900 U							
BENZYL ALCOHOL	370 U	370 U	350 U	350 U	380 U							
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	95 J	130 J	100 J	57 J	380 UJ	200 J	200 J	360 U	3300	1720 J	140 J	160 J
BUTYL BENZYL PHTHALATE	46 J	85 J	40 J	350 UJ	380 UJ	370 U	365 U	360 U	57 J	57 J	380 U	380 U
CHRYSENE	100 J	64 J	78 J	45 J	380 UJ	500	950	1400	120 J	170 J	220 J	510
DI-N-BUTYL PHTHALATE	370 UJ	370 UJ	350 UJ	350 UJ	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
DI-N-OCTYL PHTHALATE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 UJ
DIBENZO(A,H)ANTHRACENE	370 U	370 U	350 U	350 U	380 U	370 U	170 J	170 J	380 U	380 U	380 U	380 UJ

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002	10-S003
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D	10S00301
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D	10S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	52 J
DIETHYL PHTHALATE	370 U	370 U	96 J	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
DIMETHYL PHTHALATE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
FLUORANTHENE	130 J	69 J	96 J	59 J	380 U	660	1480	2300	160 J	290 J	420	880
FLUORENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	120 J
HEXACHLOROBENZENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
HEXACHLOROBUTADIENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
HEXACHLOROETHANE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	350 U	350 U	380 U	180 J	270 J	360 J	58 J	57 J	56 J	150 J
ISOPHORONE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
N-NITROSODIPHENYLAMINE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
NAPHTHALENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
NITROBENZENE	370 U	370 U	350 U	350 U	380 U	370 UJ	365 UJ	360 UJ	380 U	380 U	380 U	380 U
PENTACHLOROPHENOL	1800 U	1800 U	1700 U	1700 U	1900 U	920 UJ	910 UJ	900 UJ	950 U	960 U	970 U	950 U
PHENANTHRENE	94 J	370 U	48 J	36 J	380 U	280 J	740 J	1200	68 J	189 J	310 J	700
PHENOL	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U	380 U
PYRENE	140 J	87 J	85 J	45 J	380 UJ	580	1090	1600	170 J	230 J	290 J	1000
Pesticides PCBs (ug/kg)												
4,4'-DDD	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	4.4 J
4,4'-DDE	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ
4,4'-DDT	15 J	14 J	33 J	17 U	19 U	18 U	18 U	18 U	7 J	7.95 J	8.9 J	3.8 UJ
ALDRIN	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
ALPHA-BHC	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
ALPHA-CHLORDANE	180 U	180 U	860 U	85 U	93 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
AROCLOR-1016	180 U	180 U	860 U	85 U	93 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U	38 UJ
AROCLOR-1221	180 U	180 U	860 U	85 U	93 U	370 U	370 U	370 U	77 UJ	77.5 UJ	78 U	77 UJ
AROCLOR-1232	180 U	180 U	860 U	85 U	93 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U	38 UJ
AROCLOR-1242	180 U	180 U	860 U	85 U	93 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U	38 UJ
AROCLOR-1248	180 U	180 U	860 U	85 U	93 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U	38 UJ
AROCLOR-1254	210 J	210 J	310 J	170 U	190 U	180 U	180 U	180 U	340 J	365 J	390	51 J
AROCLOR-1260	49 J	60 J	1700 U	170 U	190 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U	38 UJ
BETA-BHC	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
DELTA-BHC	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
DIELDRIN	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ
ENDOSULFAN I	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
ENDOSULFAN II	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ
ENDOSULFAN SULFATE	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ
ENDRIN	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002	10-S003
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D	10S00301
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D	10S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U	3.8 UJ
GAMMA-BHC (LINDANE)	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
GAMMA-CHLORDANE	180 U	180 U	860 U	85 U	93 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
HEPTACHLOR	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
HEPTACHLOR EPOXIDE	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U	2 UJ
METHOXYCHLOR	180 U	180 U	860 U	85 U	93 U	94 U	94 U	94 U	20 UJ	20 UJ	20 U	20 UJ
TOXAPHENE	360 U	360 U	1700 U	170 U	190 U	940 U	940 U	940 U	200 UJ	200 UJ	200 U	200 UJ
Inorganics (mg/kg)												
ALUMINUM	11300	21600	13500	37000	23200	8760	8840	8920	8960	7425	5890	10200
ANTIMONY	2.7 U	4.2 U	2.7 U	4.1 U	4.5 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	4.1	6.9	5.4	8.8	6.1	2.5	2.55	2.6	3.6	3	2.4	2.7
BARIUM	9 J	31.5 J	9.7 J	17.5 J	7.5 J	361 J	190.5 J	40 UJ	9.2 J	8.65 J	8.1 J	24 J
BERYLLIUM	0.14 J	0.18 J	0.12 J	0.21 J	0.09 U	1 UJ	0.13 J	0.13 J	0.1 J	0.08 J	0.06 J	0.11 J
CADMIUM	0.89 J	2.4	2.3	0.9 U	0.99 U	0.91 J	0.91 J	1 U	1.4	1.35	1.3	0.77 J
CALCIUM	620 J	1620 J	583 J	1720	157 J	23200	20500	17800	1320	1049.5 J	779 J	1080 J
CHROMIUM	13.2	29.9	19.4	31.9	21.2	18.2	17.5	16.8	16	14.1	12.2	11.7
COBALT	1.4 J	2.4 J	1.1 J	1.8 J	2.1 J	0.83 J	1.415 J	2 J	0.79 J	0.805 J	0.82 J	10 U
COPPER	7.4	24.2	15.8	13	6.6 J	7.9	7.9	7.9	10.8	11.15	11.5	11.2
IRON	10000	19600	13200	23800	16100	6520	6650	6780	9660	9155	8650	8880
LEAD	19 J	47	34.1	29.3	12.5 J	38 J	35.55 J	33.1 J	32.5	30.75	29	47.8
MAGNESIUM	121 J	191 J	96.1 J	294 J	106 J	5910	5755	5600	200 J	150 J	100 J	122 J
MANGANESE	41.9	70.5	389	57.1	13.1	56.6 J	61.3 J	66 J	39.3	37.85	36.4	41.5
MERCURY	0.08 U	0.12 U	0.2	0.09 U	0.14 U	0.07	0.07	0.07	0.1 U	0.1 U	0.1 U	0.08
NICKEL	2.3 U	4.9 J	4.2 J	3.5 J	3.9 U	6.8 J	4.9 J	3 J	2 J	2 J	8 U	8 U
POTASSIUM	132 U	205 U	129 U	198 U	217 U	219 J	219 J	1000 U	69.4 J	69.4 J	1000 U	109 J
SELENIUM	0.41 U	0.63 U	0.4 U	0.61 U	0.67 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SILVER	0.33 U	0.51 U	0.32 U	0.49 U	0.54 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	182 J	290 J	228 J	387 J	289 J	1000 UJ	1000 UJ	1000 UJ	181 J	186.5 J	192 J	171 J
THALLIUM	0.45 U	0.7 U	0.44 U	0.68 U	0.74 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	25	48.1	35.7	63.4	41.1	18.9	18.8	18.7	24.5	22.65	20.8	24.3
ZINC	23.9 J	92.7 J	705	42.5 J	11.3 J	37.7	35.9	34.1	50	46.45	42.9	44.8
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.24 U	0.37 U	0.24 U	0.36 U	0.4 U	0.1 J	0.15 J	0.2 J	0.2 J	0.165 J	0.13 J	0.13 J
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS						240	210	180	105	85.55	66.1	666

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010
LOCATION	10-S004	10-S005	10-S006
NSAMPLE	10S00401	10S00501	10S00601
SAMPLE	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)			
1,1,1-TRICHLOROETHANE	12 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	12 U	11 UJ	11 U
1,1,2-TRICHLOROETHANE	12 U	11 U	11 U
1,1-DICHLOROETHANE	12 U	11 U	11 U
1,1-DICHLOROETHENE	12 U	11 U	11 U
1,2-DICHLOROETHANE	12 U	11 U	11 U
1,2-DICHLOROPROPANE	12 U	11 U	11 U
2-BUTANONE	12 U	11 U	11 U
2-HEXANONE	12 U	11 UJ	11 U
4-METHYL-2-PENTANONE	12 U	11 U	11 U
ACETONE	12 U	11 U	11 U
BENZENE	12 U	11 U	11 U
BROMODICHLOROMETHANE	12 U	11 U	11 U
BROMOFORM	12 U	11 U	11 U
BROMOMETHANE	12 U	11 U	11 U
CARBON DISULFIDE	12 U	11 U	11 U
CARBON TETRACHLORIDE	12 U	11 U	11 U
CHLOROBENZENE	12 U	11 U	11 U
CHLORODIBROMOMETHANE	12 U	11 U	11 U
CHLOROETHANE	12 U	11 U	11 U
CHLOROFORM	12 U	11 U	11 U
CHLOROMETHANE	12 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	12 U	11 U	11 U
ETHYLBENZENE	12 U	11 U	11 U
METHYLENE CHLORIDE	12 U	11 U	11 U
STYRENE	12 U	11 U	11 U
TETRACHLOROETHENE	12 U	11 U	11 U
TOLUENE	12 U	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	12 U	11 U	11 U
TOTAL XYLENES	12 U	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	12 U	11 U	11 U
TRICHLOROETHENE	12 U	11 UJ	11 U
VINYL ACETATE			
VINYL CHLORIDE	12 U	11 U	11 U
Semivolatile Organics (ug/kg)			
1,2,4-TRICHLOROBENZENE	1600 U	370 U	370 U
1,2-DICHLOROBENZENE	1600 U	370 U	370 U
1,3-DICHLOROBENZENE	1600 U	370 U	370 U
1,4-DICHLOROBENZENE	1600 U	370 U	370 U

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010
LOCATION	10-S004	10-S005	10-S006
NSAMPLE	10S00401	10S00501	10S00601
SAMPLE	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	4000 U	920 U	920 U
2,4,6-TRICHLOROPHENOL	1600 U	370 U	370 U
2,4-DICHLOROPHENOL	1600 U	370 U	370 U
2,4-DIMETHYLPHENOL	1600 U	370 U	370 U
2,4-DINITROPHENOL	4000 U	920 U	920 U
2,4-DINITROTOLUENE	1600 U	370 U	370 U
2,6-DINITROTOLUENE	1600 U	370 U	370 U
2-CHLORONAPHTHALENE	1600 U	370 U	370 U
2-CHLOROPHENOL	1600 U	370 U	370 U
2-METHYLNAPHTHALENE	1600 U	370 U	370 U
2-METHYLPHENOL	1600 U	370 U	370 U
2-NITROANILINE	4000 U	920 U	920 U
2-NITROPHENOL	1600 U	370 U	370 U
3,3'-DICHLOROBENZIDINE	1600 U	370 U	370 U
3-NITROANILINE	4000 U	920 U	920 U
4,6-DINITRO-2-METHYLPHENOL	4000 U	920 U	920 U
4-BROMOPHENYL PHENYL ETHER	1600 U	370 U	370 U
4-CHLORO-3-METHYLPHENOL	1600 U	370 U	370 U
4-CHLOROANILINE	1600 U	370 U	370 U
4-METHYLPHENOL	1600 U	370 U	370 U
4-NITROANILINE	4000 U	920 U	920 U
4-NITROPHENOL	4000 U	920 U	920 U
ACENAPHTHENE	1600 U	370 U	370 U
ACENAPHTHYLENE	1600 U	370 U	370 U
ANTHRACENE	1600 U	370 U	370 U
BENZO(A)ANTHRACENE	1400 J	370 U	370 U
BENZO(A)PYRENE	2500	370 U	370 U
BENZO(B)FLUORANTHENE	2500	92 J	370 U
BENZO(G,H,I)PERYLENE	3800	370 U	370 U
BENZO(K)FLUORANTHENE	2300	370 U	370 U
BENZOIC ACID			
BENZYL ALCOHOL			
BIS(2-CHLOROETHOXY)METHANE	1600 U	370 U	370 U
BIS(2-CHLOROETHYL)ETHER	1600 U	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	1600 U	370 U	370 U
BUTYL BENZYL PHTHALATE	1600 U	370 U	370 U
CHRYSENE	1600 J	40 J	370 U
DI-N-BUTYL PHTHALATE	1600 U	370 U	370 U
DI-N-OCTYL PHTHALATE	1600 U	370 U	370 U
DIBENZO(A,H)ANTHRACENE	1000 J	370 U	370 U

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010
LOCATION	10-S004	10-S005	10-S006
NSAMPLE	10S00401	10S00501	10S00601
SAMPLE	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB
DIBENZOFURAN	1600 U	370 U	370 U
DIETHYL PHTHALATE	1600 U	370 U	370 U
DIMETHYL PHTHALATE	1600 UJ	370 U	370 U
FLUORANTHENE	1400 J	370 U	370 U
FLUORENE	1600 U	370 U	370 U
HEXACHLOROBENZENE	1600 U	370 U	370 U
HEXACHLOROBUTADIENE	1600 U	370 U	370 U
HEXACHLOROCYCLOPENTADIENE	1600 U	370 U	370 U
HEXACHLOROETHANE	1600 U	370 U	370 U
INDENO(1,2,3-CD)PYRENE	3200	370 U	370 U
ISOPHORONE	1600 U	370 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	1600 U	370 U	370 U
N-NITROSODIPHENYLAMINE	1600 U	370 U	370 U
NAPHTHALENE	1600 U	370 U	370 U
NITROBENZENE	1600 U	370 U	370 UJ
PENTACHLOROPHENOL	4000 U	920 U	920 UJ
PHENANTHRENE	1600 U	370 U	370 U
PHENOL	1600 U	370 U	370 U
PYRENE	1800	46 J	370 U
Pesticides PCBs (ug/kg)			
4,4'-DDD	20 U	3.7 U	3.6 U
4,4'-DDE	37	3.7 U	3.6 U
4,4'-DDT	35	2.1	12
ALDRIN	10 U	1.9 U	1.9 U
ALPHA-BHC	10 U	1.9 U	1.9 U
ALPHA-CHLORDANE	5.2 J	1.9 U	1.1 J
AROCLOR-1016	200 U	37 U	36 U
AROCLOR-1221	400 U	74 U	74 U
AROCLOR-1232	200 U	37 U	36 U
AROCLOR-1242	200 U	37 U	36 U
AROCLOR-1248	200 U	37 U	36 U
AROCLOR-1254	200 U	37 U	36 U
AROCLOR-1260	200 U	37 U	36 U
BETA-BHC	10 U	1.9 U	1.9 U
DELTA-BHC	10 U	1.9 U	1.9 U
DIELDRIN	19	3.7 U	3.6 U
ENDOSULFAN I	10 U	1.9 UJ	1.9 U
ENDOSULFAN II	20 U	3.7 U	3.6 U
ENDOSULFAN SULFATE	20 U	3.7 U	3.6 U
ENDRIN	20 U	3.7 U	3.6 U

APPENDIX TABLE A-2-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010
LOCATION	10-S004	10-S005	10-S006
NSAMPLE	10S00401	10S00501	10S00601
SAMPLE	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB
ENDRIN KETONE	20 U	3.7 U	3.6 U
GAMMA-BHC (LINDANE)	10 U	1.9 U	1.9 U
GAMMA-CHLORDANE	10 U	1.9 U	6.4
HEPTACHLOR	10 U	1.9 U	5.2
HEPTACHLOR EPOXIDE	10 U	1.9 U	2.4
METHOXYCHLOR	100 U	19 U	19 U
TOXAPHENE	1000 U	190 U	190 U
Inorganics (mg/kg)			
ALUMINUM	29300	9740	11300
ANTIMONY	12 UJ	12 UJ	12 UJ
ARSENIC	6.1	3.8	3.1
BARIUM	24 J	8.4 J	9.2 J
BERYLLIUM	0.26 J	0.11 J	1 UJ
CADMIUM	1 U	0.5 J	1 U
CALCIUM	1090 J	239 J	259 J
CHROMIUM	25	10.1	18
COBALT	1.7 J	0.86 J	0.93 J
COPPER	10.4	5.2 J	5 U
IRON	19100	8860	9080
LEAD	25.9 J	8.6	9.2 J
MAGNESIUM	397 J	77.7 J	123 J
MANGANESE	107 J	38	71.2 J
MERCURY	0.04 J	0.1 U	0.01 J
NICKEL	6.5 J	8 U	7 J
POTASSIUM	299 J	70.5 J	1000 U
SELENIUM	0.29 J	1 UJ	1 UJ
SILVER	2 U	2 U	2 U
SODIUM	1000 UJ	160 J	1000 UJ
THALLIUM	2 U	0.13 J	2 U
VANADIUM	49.4	21.2	21.8
ZINC	30	11.2	4 U
Miscellaneous Parameters (mg/kg)			
CYANIDE	0.11 J	0.12 J	0.5 U
Petroleum Hydrocarbons (mg/kg)			
TOTAL PETROLEUM HYDROCARBONS	56.8	3.3	54

APPENDIX TABLE A-2-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	12 U	11 U
2-BUTANONE	12 U	62	51	40	11 U
2-HEXANONE	12 U	12 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	12 U	11 U
ACETONE	25 UJ	270 UJ	230 UJ	190 UJ	82 UJ
BENZENE	12 U	12 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	12 U	11 U
BROMOFORM	12 U	12 U	12 U	12 U	11 U
BROMOMETHANE	12 U	12 U	12 U	12 U	11 U
CARBON DISULFIDE	2 J	3 J	2.5 J	2 J	5 J
CARBON TETRACHLORIDE	12 U	12 U	12 U	12 U	11 U
CHLOROBENZENE	12 U	12 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	12 U	12 U	12 U	12 U	11 U
CHLOROETHANE	12 U	12 U	12 U	12 U	11 U
CHLOROFORM	12 U	12 U	12 U	12 U	11 U
CHLOROMETHANE	12 U	12 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	11 U
ETHYLBENZENE	20	4 J	3 J	2 J	11 U
METHYLENE CHLORIDE	14 UJ	34 UJ	29.5 UJ	25 UJ	11 UJ
STYRENE	12 U	12 U	12 U	12 U	11 U
TETRACHLOROETHENE	12 U	12 U	12 U	12 U	11 U
TOLUENE	12 U	1 J	1 J	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	12 U	12 U	12 U	12 U	11 U
TOTAL XYLENES	4 J	5 J	4 J	3 J	1 J
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	11 U
TRICHLOROETHENE	12 U	12 U	12 U	12 U	11 U
VINYL CHLORIDE	12 U	12 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	390 U	410 U	420 U	430 U	370 U
1,2-DICHLOROBENZENE	390 U	410 U	420 U	430 U	370 U
1,3-DICHLOROBENZENE	390 U	410 U	420 U	430 U	370 U
1,4-DICHLOROBENZENE	390 U	410 U	420 U	430 U	370 U
2,4,5-TRICHLOROPHENOL	940 U	1000 U	1000 U	1000 U	910 U

APPENDIX TABLE A-2-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	390 U	410 U	420 U	430 U	370 U
2,4-DICHLOROPHENOL	390 U	410 U	420 U	430 U	370 U
2,4-DIMETHYLPHENOL	390 U	410 U	420 U	430 U	370 U
2,4-DINITROPHENOL	940 UJ	1000 U	1000 U	1000 U	910 UJ
2,4-DINITROTOLUENE	390 U	410 UJ	420 UJ	430 UJ	370 U
2,6-DINITROTOLUENE	390 U	410 UJ	420 UJ	430 UJ	370 U
2-CHLORONAPHTHALENE	390 U	410 U	420 U	430 U	370 U
2-CHLOROPHENOL	390 U	410 U	420 U	430 U	370 U
2-METHYLNAPHTHALENE	95 J	160 J	175 J	190 J	370 U
2-METHYLPHENOL	390 U	410 U	420 U	430 U	370 U
2-NITROANILINE	940 U	1000 U	1000 U	1000 U	910 U
2-NITROPHENOL	390 U	410 U	420 U	430 U	370 U
3,3'-DICHLOROBENZIDINE	390 U	410 U	420 U	430 U	370 UJ
3-NITROANILINE	940 U	1000 UJ	1000 UJ	1000 UJ	910 U
4,6-DINITRO-2-METHYLPHENOL	940 UJ	1000 U	1000 U	1000 U	910 UJ
4-BROMOPHENYL PHENYL ETHER	390 U	410 U	420 U	430 U	370 U
4-CHLORO-3-METHYLPHENOL	390 U	410 U	420 U	430 U	370 U
4-CHLOROANILINE	390 U	410 U	420 U	430 U	370 U
4-METHYLPHENOL	390 U	410 U	420 U	430 U	370 U
4-NITROANILINE	940 UJ	1000 UJ	1000 UJ	1000 UJ	910 UJ
4-NITROPHENOL	940 UJ	1000 U	1000 U	1000 U	910 UJ
ACENAPHTHENE	110 J	47 J	47 J	430 U	370 U
ACENAPHTHYLENE	390 U	410 U	420 U	430 U	370 U
ANTHRACENE	390 U	410 U	420 U	430 U	370 U
BENZO(A)ANTHRACENE	390 U	410 U	420 U	430 U	370 U
BENZO(A)PYRENE	390 U	410 U	420 U	430 U	370 U
BENZO(B)FLUORANTHENE	390 U	410 U	420 U	430 U	370 U
BENZO(G,H,I)PERYLENE	390 U	410 U	420 U	430 U	370 U
BENZO(K)FLUORANTHENE	390 UJ	410 U	420 U	430 U	370 UJ
BIS(2-CHLOROETHOXY)METHANE	390 U	410 U	420 U	430 U	370 U
BIS(2-CHLOROETHYL)ETHER	390 U	410 U	420 U	430 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	410 UJ	420 UJ	430 UJ	370 U
BUTYL BENZYL PHTHALATE	390 U	410 U	420 U	430 U	370 U
CHRYSENE	390 U	410 U	420 U	430 U	370 U
DI-N-BUTYL PHTHALATE	390 U	410 UJ	420 UJ	430 UJ	370 UJ
DI-N-OCTYL PHTHALATE	390 U	410 U	420 U	430 U	370 U
DIBENZO(A,H)ANTHRACENE	390 U	410 U	420 U	430 U	370 U
DIBENZOFURAN	82 J	410 U	420 U	430 U	370 U
DIETHYL PHTHALATE	390 U	410 U	420 U	430 U	370 U
DIMETHYL PHTHALATE	390 U	410 U	420 U	430 U	370 U

APPENDIX TABLE A-2-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	390 U	70 J	58 J	46 J	370 U
FLUORENE	140 J	55 J	55 J	430 U	370 U
HEXACHLOROBENZENE	390 U	410 U	420 U	430 U	370 U
HEXACHLOROBUTADIENE	390 U	410 U	420 U	430 U	370 U
HEXACHLOROCYCLOPENTADIENE	390 U	410 U	420 U	430 U	370 U
HEXACHLOROETHANE	390 U	410 U	420 U	430 U	370 U
INDENO(1,2,3-CD)PYRENE	390 U	410 U	420 U	430 U	370 U
ISOPHORONE	390 U	410 UJ	420 UJ	430 UJ	370 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	410 U	420 U	430 U	370 U
N-NITROSODIPHENYLAMINE	390 U	410 U	420 U	430 U	370 U
NAPHTHALENE	160 J	240 J	250 J	260 J	370 U
NITROBENZENE	390 U	410 UJ	420 UJ	430 UJ	370 U
PENTACHLOROPHENOL	940 U	1000 U	1000 U	1000 U	910 U
PHENANTHRENE	77 J	130 J	115 J	100 J	370 U
PHENOL	390 U	410 U	420 U	430 U	370 U
PYRENE	390 U	410 U	51 J	51 J	370 U
Pesticides PCBs (ug/kg)					
4,4'-DDD	10	16 U	16.5 U	17 U	1.4 J
4,4'-DDE	9.3	16 U	16.5 U	17 U	0.66 J
4,4'-DDT	3.9 J	16 U	16.5 U	17 U	3.7 U
ALDRIN	3.9 J	8.5 U	8.65 U	8.8 U	1.9 U
ALPHA-BHC	2 U	8.5 U	8.65 U	8.8 U	1.9 U
ALPHA-CHLORDANE	2 U	8.5 U	8.65 U	8.8 U	1.9 U
AROCLOR-1016	39 U	160 U	165 U	170 U	37 U
AROCLOR-1221	79 U	340 U	345 U	350 U	76 U
AROCLOR-1232	39 U	160 U	165 U	170 U	37 U
AROCLOR-1242	39 U	160 U	165 U	170 U	37 U
AROCLOR-1248	39 U	160 U	165 U	170 U	37 U
AROCLOR-1254	39 U	160 U	165 U	170 U	37 U
AROCLOR-1260	39 U	160 U	165 U	170 U	37 U
BETA-BHC	2 U	8.5 U	8.65 U	8.8 U	1.9 U
DELTA-BHC	2 U	8.5 U	8.65 U	8.8 U	1.9 U
DIELDRIN	5	16 U	16.5 U	17 U	3.7 U
ENDOSULFAN I	2 U	8.5 U	8.65 U	8.8 U	1.9 U
ENDOSULFAN II	3.9 U	16 U	16.5 U	17 U	3.7 U
ENDOSULFAN SULFATE	3.9 U	16 U	16.5 U	17 U	3.7 U
ENDRIN	3.9 U	16 U	16.5 U	17 U	3.7 U
ENDRIN KETONE	3.9 U	16 U	16.5 U	17 U	3.7 U
GAMMA-BHC (LINDANE)	2 U	8.5 U	8.65 U	8.8 U	1.9 U
GAMMA-CHLORDANE	2 U	8.5 U	8.65 U	8.8 U	1.9 U

APPENDIX TABLE A-2-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	2 U	8.5 U	8.65 U	8.8 U	1.9 U
HEPTACHLOR EPOXIDE	2 U	8.5 U	8.65 U	8.8 U	1.9 U
METHOXYCHLOR	20 U	85 U	86.5 U	88 U	19 U
TOXAPHENE	200 U	850 U	865 U	880 U	190 U
Inorganics (mg/kg)					
ALUMINUM	12300	11300	12000	12700	12400
ANTIMONY	7.9 J	3.1 UJ	3.05 UJ	3 UJ	2.8 U
ARSENIC	1.7 J	2.4 J	2.45 J	2.5	3.7
BARIUM	14.6 J	13.5 J	13 J	12.5 J	28.2 J
BERYLLIUM	0.4 J	0.13 J	0.17 J	0.21 J	0.16 J
CADMIUM	0.91 J	0.75 U	0.73 U	0.71 U	0.67 U
CALCIUM	4100	729 UJ	874.5 UJ	1020 UJ	502 J
CHROMIUM	207	11.9 J	12.75 J	13.6 J	11.2
COBALT	2.5 J	0.84 U	0.82 U	0.8 U	0.75 U
COPPER	11.9	4.7 J	5.1 J	5.5 J	4.5 J
IRON	44600	7270 J	7495 J	7720 J	7750
LEAD	82.4	14.3	13.85	13.4	64.8
MAGNESIUM	160 J	130 J	148.5 J	167 J	90.9 J
MANGANESE	124	39.8 J	40.7 J	41.6 J	13.3
MERCURY	0.12 J	0.18 UJ	0.135 UJ	0.09 UJ	0.08 J
NICKEL	4.2 J	3.2 UJ	3.1 UJ	3 UJ	1.9 J
POTASSIUM	185 J	171 U	192.25 J	299 J	154 U
SELENIUM	0.49 U	0.53 UJ	0.4675 J	0.67 J	0.47 U
SILVER	1 J	0.51 U	0.435 U	0.36 U	0.46 J
SODIUM	182 J	208 UJ	209 UJ	210 UJ	212 J
THALLIUM	0.37 U	0.4 U	0.39 U	0.38 U	0.36 U
VANADIUM	104	18.8 J	19.8 J	20.8 J	22.7
ZINC	27.3	21.6	19.4	17.2	24.9
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.1 U	0.11 U	0.105 U	0.1 U	0.49 J

APPENDIX TABLE A-2-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
2-HEXANONE	11 UJ	12 UJ	11 UJ	11 U	11 UJ	11 U	11 U	11 U	11 UJ	4 J	4 J
TOTAL XYLENES	6 U	6 U	5 U	1 J	6 U	11 U	11 U	11 U	11 U	11.5 U	12 U
Semivolatile Organics (ug/kg)											
ACENAPHTHENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	40 J	40 J
ANTHRACENE	370 U	370 U	350 U	350 U	380 U	370 U	270 J	270 J	380 U	54 J	54 J
BENZO(A)ANTHRACENE	81 J	57 J	59 J	42 J	380 U	340	770	1200	87 J	138.5 J	190 J
BENZO(A)PYRENE	46 J	45 J	350 U	350 U	380 U	400	700	1000	95 J	122.5 J	150 J
BENZO(B)FLUORANTHENE	71 J	78 J	62 J	350 U	380 U	480	890	1300	150 J	175 J	200 J
BENZO(G,H,I)PERYLENE	370 U	370 U	350 U	350 U	380 U	180 J	260 J	340 J	380 U	380 U	380 U
BENZO(K)FLUORANTHENE	76 J	74 J	62 J	350 U	380 U	360 J	630 J	900	110 J	160 J	210 J
BIS(2-ETHYLHEXYL)PHTHALATE	95 J	130 J	100 J	57 J	380 UJ	200 J	200 J	360 U	3300	1720 J	140 J
BUTYL BENZYL PHTHALATE	46 J	85 J	40 J	350 UJ	380 UJ	370 U	365 U	360 U	57 J	57 J	380 U
CHRYSENE	100 J	64 J	78 J	45 J	380 UJ	500	950	1400	120 J	170 J	220 J
DIBENZO(A,H)ANTHRACENE	370 U	370 U	350 U	350 U	380 U	370 U	170 J	170 J	380 U	380 U	380 U
DIBENZOFURAN	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U
DIETHYL PHTHALATE	370 U	370 U	96 J	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U
FLUORANTHENE	130 J	69 J	96 J	59 J	380 U	660	1480	2300	160 J	290 J	420
FLUORENE	370 U	370 U	350 U	350 U	380 U	370 U	365 U	360 U	380 U	380 U	380 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	350 U	350 U	380 U	180 J	270 J	360 J	58 J	57 J	56 J
PHENANTHRENE	94 J	370 U	48 J	36 J	380 U	280 J	740 J	1200	68 J	189 J	310 J
PYRENE	140 J	87 J	85 J	45 J	380 UJ	580	1090	1600	170 J	230 J	290 J
Pesticides PCBs (ug/kg)											
4,4'-DDD	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U
4,4'-DDE	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U
4,4'-DDT	15 J	14 J	33 J	17 U	19 U	18 U	18 U	18 U	7 J	7.95 J	8.9 J
ALPHA-CHLORDANE	180 U	180 U	860 U	85 U	93 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U
AROCLOR-1254	210 J	210 J	310 J	170 U	190 U	180 U	180 U	180 U	340 J	365 J	390
AROCLOR-1260	49 J	60 J	1700 U	170 U	190 U	180 U	180 U	180 U	38 UJ	38 UJ	38 U
DIELDRIN	36 U	36 U	170 U	17 U	19 U	18 U	18 U	18 U	3.8 UJ	3.8 UJ	3.8 U
GAMMA-CHLORDANE	180 U	180 U	860 U	85 U	93 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U
HEPTACHLOR	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U
HEPTACHLOR EPOXIDE	18 U	18 U	86 U	8.5 U	9.3 U	9.4 U	9.4 U	9.4 U	2 UJ	2 UJ	2 U
Inorganics (mg/kg)											
ALUMINUM	11300	21600	13500	37000	23200	8760	8840	8920	8960	7425	5890
ARSENIC	4.1	6.9	5.4	8.8	6.1	2.5	2.55	2.6	3.6	3	2.4
BARIUM	9 J	31.5 J	9.7 J	17.5 J	7.5 J	361 J	190.5 J	40 UJ	9.2 J	8.65 J	8.1 J
BERYLLIUM	0.14 J	0.18 J	0.12 J	0.21 J	0.09 U	1 UJ	0.13 J	0.13 J	0.1 J	0.08 J	0.06 J
CADMIUM	0.89 J	2.4	2.3	0.9 U	0.99 U	0.91 J	0.91 J	1 U	1.4	1.35	1.3
CALCIUM	620 J	1620 J	583 J	1720	157 J	23200	20500	17800	1320	1049.5 J	779 J

APPENDIX TABLE A-2-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010	0010
LOCATION	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10-S001	10-S001	10-S001	10-S002	10-S002	10-S002
NSAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101-D	10S00201	10S00201-AVG	10S00201-D
SAMPLE	10-SL-01	10-SL-02	10-SL-03	10-SL-04	10-SL-05	10S00101	10S00101-AVG	10S00101D	10S00201	10S00201-AVG	10S00201D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	12/7/1995	12/7/1995	12/7/1995	1/5/1996	1/5/1996	1/5/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHROMIUM	13.2	29.9	19.4	31.9	21.2	18.2	17.5	16.8	16	14.1	12.2
COBALT	1.4 J	2.4 J	1.1 J	1.8 J	2.1 J	0.83 J	1.415 J	2 J	0.79 J	0.805 J	0.82 J
COPPER	7.4	24.2	15.8	13	6.6 J	7.9	7.9	7.9	10.8	11.15	11.5
IRON	10000	19600	13200	23800	16100	6520	6650	6780	9660	9155	8650
LEAD	19 J	47	34.1	29.3	12.5 J	38 J	35.55 J	33.1 J	32.5	30.75	29
MAGNESIUM	121 J	191 J	96.1 J	294 J	106 J	5910	5755	5600	200 J	150 J	100 J
MANGANESE	41.9	70.5	389	57.1	13.1	56.6 J	61.3 J	66 J	39.3	37.85	36.4
MERCURY	0.08 U	0.12 U	0.2	0.09 U	0.14 U	0.07	0.07	0.07	0.1 U	0.1 U	0.1 U
NICKEL	2.3 U	4.9 J	4.2 J	3.5 J	3.9 U	6.8 J	4.9 J	3 J	2 J	2 J	8 U
POTASSIUM	132 U	205 U	129 U	198 U	217 U	219 J	219 J	1000 U	69.4 J	69.4 J	1000 U
SELENIUM	0.41 U	0.63 U	0.4 U	0.61 U	0.67 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SODIUM	182 J	290 J	228 J	387 J	289 J	1000 UJ	1000 UJ	1000 UJ	181 J	186.5 J	192 J
THALLIUM	0.45 U	0.7 U	0.44 U	0.68 U	0.74 U	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	25	48.1	35.7	63.4	41.1	18.9	18.8	18.7	24.5	22.65	20.8
ZINC	23.9 J	92.7 J	705	42.5 J	11.3 J	37.7	35.9	34.1	50	46.45	42.9
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.24 U	0.37 U	0.24 U	0.36 U	0.4 U	0.1 J	0.15 J	0.2 J	0.2 J	0.165 J	0.13 J
Petroleum Hydrocarbon (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS						240	210	180	105	85.55	66.1

APPENDIX TABLE A-2-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010
LOCATION	10-S003	10-S004	10-S005	10-S006
NSAMPLE	10S00301	10S00401	10S00501	10S00601
SAMPLE	10S00301	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1996	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)				
2-HEXANONE	11 UJ	12 U	11 UJ	11 U
TOTAL XYLENES	11 U	12 U	11 U	11 U
Semivolatile Organics (ug/kg)				
ACENAPHTHENE	110 J	1600 U	370 U	370 U
ANTHRACENE	200 J	1600 U	370 U	370 U
BENZO(A)ANTHRACENE	490	1400 J	370 U	370 U
BENZO(A)PYRENE	350 J	2500	370 U	370 U
BENZO(B)FLUORANTHENE	530 J	2500	92 J	370 U
BENZO(G,H,I)PERYLENE	380 UJ	3800	370 U	370 U
BENZO(K)FLUORANTHENE	420 J	2300	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	160 J	1600 U	370 U	370 U
BUTYL BENZYL PHTHALATE	380 U	1600 U	370 U	370 U
CHRYSENE	510	1600 J	40 J	370 U
DIBENZO(A,H)ANTHRACENE	380 UJ	1000 J	370 U	370 U
DIBENZOFURAN	52 J	1600 U	370 U	370 U
DIETHYL PHTHALATE	380 U	1600 U	370 U	370 U
FLUORANTHENE	880	1400 J	370 U	370 U
FLUORENE	120 J	1600 U	370 U	370 U
INDENO(1,2,3-CD)PYRENE	150 J	3200	370 U	370 U
PHENANTHRENE	700	1600 U	370 U	370 U
PYRENE	1000	1800	46 J	370 U
Pesticides PCBs (ug/kg)				
4,4'-DDD	4.4 J	20 U	3.7 U	3.6 U
4,4'-DDE	3.8 UJ	37	3.7 U	3.6 U
4,4'-DDT	3.8 UJ	35	2.1	12
ALPHA-CHLORDANE	2 UJ	5.2 J	1.9 U	1.1 J
AROCLOR-1254	51 J	200 U	37 U	36 U
AROCLOR-1260	38 UJ	200 U	37 U	36 U
DIELDRIN	3.8 UJ	19	3.7 U	3.6 U
GAMMA-CHLORDANE	2 UJ	10 U	1.9 U	6.4
HEPTACHLOR	2 UJ	10 U	1.9 U	5.2
HEPTACHLOR EPOXIDE	2 UJ	10 U	1.9 U	2.4
Inorganics (mg/kg)				
ALUMINUM	10200	29300	9740	11300
ARSENIC	2.7	6.1	3.8	3.1
BARIUM	24 J	24 J	8.4 J	9.2 J
BERYLLIUM	0.11 J	0.26 J	0.11 J	1 UJ
CADMIUM	0.77 J	1 U	0.5 J	1 U
CALCIUM	1080 J	1090 J	239 J	259 J

APPENDIX TABLE A-2-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010
LOCATION	10-S003	10-S004	10-S005	10-S006
NSAMPLE	10S00301	10S00401	10S00501	10S00601
SAMPLE	10S00301	10S00401	10S00501	10S00601
SUBMATRIX	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1996	12/7/1995	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
CHROMIUM	11.7	25	10.1	18
COBALT	10 U	1.7 J	0.86 J	0.93 J
COPPER	11.2	10.4	5.2 J	5 U
IRON	8880	19100	8860	9080
LEAD	47.8	25.9 J	8.6	9.2 J
MAGNESIUM	122 J	397 J	77.7 J	123 J
MANGANESE	41.5	107 J	38	71.2 J
MERCURY	0.08	0.04 J	0.1 U	0.01 J
NICKEL	8 U	6.5 J	8 U	7 J
POTASSIUM	109 J	299 J	70.5 J	1000 U
SELENIUM	1 UJ	0.29 J	1 UJ	1 UJ
SODIUM	171 J	1000 UJ	160 J	1000 UJ
THALLIUM	2 U	2 U	0.13 J	2 U
VANADIUM	24.3	49.4	21.2	21.8
ZINC	44.8	30	11.2	4 U
Miscellaneous Parameters (mg/kg)				
CYANIDE	0.13 J	0.11 J	0.12 J	0.5 U
Petroleum Hydrocarbon (mg/kg)				
TOTAL PETROLEUM HYDROCARBONS	666	56.8	3.3	54

APPENDIX TABLE A-2-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
2-BUTANONE	12 U	62	51	40	11 U
CARBON DISULFIDE	2 J	3 J	2.5 J	2 J	5 J
ETHYLBENZENE	20	4 J	3 J	2 J	11 U
TOLUENE	12 U	1 J	1 J	12 U	11 U
TOTAL XYLENES	4 J	5 J	4 J	3 J	1 J
Semivolatile Organics (ug/kg)					
2-METHYLNAPHTHALENE	95 J	160 J	175 J	190 J	370 U
ACENAPHTHENE	110 J	47 J	47 J	430 U	370 U
DIBENZOFURAN	82 J	410 U	420 U	430 U	370 U
FLUORANTHENE	390 U	70 J	58 J	46 J	370 U
FLUORENE	140 J	55 J	55 J	430 U	370 U
NAPHTHALENE	160 J	240 J	250 J	260 J	370 U
PHENANTHRENE	77 J	130 J	115 J	100 J	370 U
PYRENE	390 U	410 U	51 J	51 J	370 U
Pesticides PCBs (ug/kg)					
4,4'-DDD	10	16 U	16.5 U	17 U	1.4 J
4,4'-DDE	9.3	16 U	16.5 U	17 U	0.66 J
4,4'-DDT	3.9 J	16 U	16.5 U	17 U	3.7 U
ALDRIN	3.9 J	8.5 U	8.65 U	8.8 U	1.9 U
DIELDRIN	5	16 U	16.5 U	17 U	3.7 U
Inorganics (mg/kg)					
ALUMINUM	12300	11300	12000	12700	12400
ANTIMONY	7.9 J	3.1 UJ	3.05 UJ	3 UJ	2.8 U
ARSENIC	1.7 J	2.4 J	2.45 J	2.5	3.7
BARIUM	14.6 J	13.5 J	13 J	12.5 J	28.2 J
BERYLLIUM	0.4 J	0.13 J	0.17 J	0.21 J	0.16 J
CADMIUM	0.91 J	0.75 U	0.73 U	0.71 U	0.67 U
CALCIUM	4100	729 UJ	874.5 UJ	1020 UJ	502 J
CHROMIUM	207	11.9 J	12.75 J	13.6 J	11.2
COBALT	2.5 J	0.84 U	0.82 U	0.8 U	0.75 U
COPPER	11.9	4.7 J	5.1 J	5.5 J	4.5 J
IRON	44600	7270 J	7495 J	7720 J	7750
LEAD	82.4	14.3	13.85	13.4	64.8
MAGNESIUM	160 J	130 J	148.5 J	167 J	90.9 J
MANGANESE	124	39.8 J	40.7 J	41.6 J	13.3
MERCURY	0.12 J	0.18 UJ	0.135 UJ	0.09 UJ	0.08 J
NICKEL	4.2 J	3.2 UJ	3.1 UJ	3 UJ	1.9 J
POTASSIUM	185 J	171 U	192.25 J	299 J	154 U
SELENIUM	0.49 U	0.53 UJ	0.4675 J	0.67 J	0.47 U

APPENDIX TABLE A-2-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0010	0010	0010	0010	0010
LOCATION	10-SS0201	10-SS0302	10-SS0302	10-SS0302	10-SS0503
NSAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302-D	10SS0503
SAMPLE	10SS0201	10SS0302	10SS0302-AVG	10SS0302A	10SS0503
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	4 - 5	6 - 8	6 - 8	6 - 8	8 - 9.5
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/7/1992	10/7/1992	10/7/1992	10/7/1992	10/7/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
SILVER	1 J	0.51 U	0.435 U	0.36 U	0.46 J
SODIUM	182 J	208 UJ	209 UJ	210 UJ	212 J
VANADIUM	104	18.8 J	19.8 J	20.8 J	22.7
ZINC	27.3	21.6	19.4	17.2	24.9
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.1 U	0.11 U	0.105 U	0.1 U	0.49 J

APPENDIX TABLE A-2-5
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-HEXANONE	1/11	4 J	4 J	11 - 12	5.45	4.00	10S00201-D
TOTAL XYLENES	1/11	1 J	1 J	5 - 12	4.20	1.00	10-SL-04
Semivolatile Organics (ug/kg)							
ACENAPHTHENE	2/11	40 J	110 J	350 - 1600	219	75.0	10S00301
ANTHRACENE	3/11	54 J	270 J	350 - 1600	237	175	10S00101-D
BENZO(A)ANTHRACENE	8/11	42 J	1400 J	370 - 380	327	380	10S00401
BENZO(A)PYRENE	6/11	45 J	2500	350 - 380	425	627	10S00401
BENZO(B)FLUORANTHENE	8/11	62 J	2500	350 - 380	450	550	10S00401
BENZO(G,H,I)PERYLENE	2/11	180 J	3800	350 - 380	520	2030	10S00401
BENZO(K)FLUORANTHENE	7/11	62 J	2300	350 - 380	405	532	10S00401
BIS(2-ETHYLHEXYL)PHTHALATE	7/11	57 J	3300	360 - 1600	347	352	10S00201
BUTYL BENZYL PHTHALATE	4/11	40 J	85 J	350 - 1600	194	57.0	10-SL-02
CHRYSENE	9/11	40 J	1600 J	370 - 380	357	395	10S00401
DIBENZO(A,H)ANTHRACENE	2/11	170 J	1000 J	350 - 380	257	585	10S00401
DIBENZOFURAN	1/11	52 J	52 J	350 - 1600	228	52.0	10S00301
DIETHYL PHTHALATE	1/11	96 J	96 J	350 - 1600	233	96.0	10-SL-03
FLUORANTHENE	8/11	59 J	2300	370 - 380	451	551	10S00101-D
FLUORENE	1/11	120 J	120 J	350 - 1600	234	120	10S00301
INDENO(1,2,3-CD)PYRENE	4/11	56 J	3200	350 - 380	451	919	10S00401
PHENANTHRENE	6/11	36 J	1200	370 - 1600	305	301	10S00101-D
PYRENE	9/11	45 J	1800	370 - 380	445	503	10S00401
Pesticides PCBs (mg/kg)							
4,4'-DDD	1/11	4.4 J	4.4 J	3.6 - 170	15.3	4.40	10S00301
4,4'-DDE	1/11	37	37	3.6 - 170	17.5	37.0	10S00401
4,4'-DDT	7/11	2.1	35	3.8 - 19	13.5	17.0	10S00401
ALPHA-CHLORDANE	2/11	1.1 J	5.2 J	1.9 - 860	64.8	3.15	10S00401
AROCLOR-1254	5/11	51 J	390	36 - 200	141	229	10S00201-D
AROCLOR-1260	2/11	49 J	60 J	36 - 1700	128	54.5	10-SL-02
DIELDRIN	1/11	19	19	3.6 - 170	15.9	19.0	10S00401
GAMMA-CHLORDANE	1/11	6.4	6.4	1.9 - 860	65.3	6.40	10S00601
HEPTACHLOR	1/11	5.2	5.2	1.9 - 86	7.98	5.20	10S00601
HEPTACHLOR EPOXIDE	1/11	2.4	2.4	1.9 - 86	7.72	2.40	10S00601
Inorganics (mg/kg)							
ALUMINUM	11/11	5890	37000	---	16673	16673	10-SL-04
ARSENIC	11/11	2.4	8.8	---	4.78	4.78	10-SL-04
BARIUM	11/11	7.5 J	361 J	40	30.9	30.9	10S00101
BERYLLIUM	9/11	0.06 J	0.26 J	0.09 - 1	0.171	0.149	10S00401
CADMIUM	7/11	0.5 J	2.4	0.9 - 1	1.01	1.30	10-SL-02
CALCIUM	11/11	157 J	23200	---	2629	2629	10S00101
CHROMIUM	11/11	10.1	31.9	---	19.3	19.3	10-SL-04
COBALT	10/11	0.79 J	2.4 J	10	1.77	1.45	10-SL-02
COPPER	10/11	5.2 J	24.2	5	10.5	11.3	10-SL-02

APPENDIX TABLE A-2-5
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
IRON	11/11	6520	23800	---	13130	13130	10-SL-04
LEAD	11/11	8.6	47.8	---	27.2	27.2	10S00301
MAGNESIUM	11/11	77.7 J	5910	---	676	676	10S00101
MANGANESE	11/11	13.1	389	---	84.4	84.4	10-SL-03
MERCURY	5/11	0.01 J	0.2	0.08 - 0.14	0.0650	0.0800	10-SL-03
NICKEL	7/11	2 J	7 J	2.3 - 8	4.01	4.71	10S00601
POTASSIUM	5/11	69.4 J	299 J	129 - 1000	155	153	10S00401
SELENIUM	1/11	0.29 J	0.29 J	0.4 - 1	0.377	0.290	10S00401
SODIUM	8/11	160 J	387 J	1000	309	237	10-SL-04
THALLIUM	1/11	0.13 J	0.13 J	0.44 - 2	0.603	0.130	10S00501
VANADIUM	11/11	18.7	63.4	---	33.8	33.8	10-SL-04
ZINC	10/11	11.2	705	4	95.1	104	10-SL-03
Miscellaneous Parameters (mg/kg)							
CYANIDE	5/11	0.1 J	0.2 J	0.24 - 0.5	0.157	0.135	10S00101-D, 10S00201
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	6/6	3.3	666	---	179	179	10S00301

APPENDIX TABLE A-2-6
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	1/3	40	62	11 - 12	20.8	51.0	10SS0302
CARBON DISULFIDE	3/3	2 J	5 J	---	3.17	3.17	10SS0503
ETHYLBENZENE	2/3	2 J	20	11	9.50	11.5	10SS0201
TOLUENE	1/3	1 J	1 J	11 - 12	4.17	1.00	10SS0302
TOTAL XYLENES	3/3	1 J	5 J	---	3.00	3.00	10SS0302
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	2/3	95 J	190 J	370	152	135	10SS0302-D
ACENAPHTHENE	2/3	47 J	110 J	370 - 430	114	78.5	10SS0201
DIBENZOFURAN	1/3	82 J	82 J	370 - 430	159	82.0	10SS0201
FLUORANTHENE	1/3	46 J	70 J	370 - 390	146	58.0	10SS0302
FLUORENE	2/3	55 J	140 J	370 - 430	127	97.5	10SS0201
NAPHTHALENE	2/3	160 J	260 J	370	198	205	10SS0302-D
PHENANTHRENE	2/3	77 J	130 J	370	126	96.0	10SS0302
PYRENE	1/3	51 J	51 J	370 - 410	144	51.0	10SS0302-D
Pesticides PCBs (ug/kg)							
4,4'-DDD	2/3	1.4 J	10	16 - 17	6.55	5.70	10SS0201
4,4'-DDE	2/3	0.66 J	9.3	16 - 17	6.07	4.98	10SS0201
4,4'-DDT	1/3	3.9 J	3.9 J	3.7 - 17	4.67	3.90	10SS0201
ALDRIN	1/3	3.9 J	3.9 J	1.9 - 8.8	3.06	3.90	10SS0201
DIELDRIN	1/3	5	5	3.7 - 17	5.03	5.00	10SS0201
Inorganics (mg/kg)							
ALUMINUM	3/3	11300	12700	---	12233	12233	10SS0302-D
ANTIMONY	1/3	7.9 J	7.9 J	2.8 - 3.1	3.61	7.90	10SS0201
ARSENIC	3/3	1.7 J	3.7	---	2.62	2.62	10SS0503
BARIUM	3/3	12.5 J	28.2 J	---	18.6	18.6	10SS0503
BERYLLIUM	3/3	0.13 J	0.4 J	---	0.243	0.243	10SS0201
CADMIUM	1/3	0.91 J	0.91 J	0.67 - 0.75	0.537	0.910	10SS0201
CALCIUM	2/3	502 J	4100	729 - 1020	1680	2301	10SS0201
CHROMIUM	3/3	11.2	207	---	77.0	77.0	10SS0201
COBALT	1/3	2.5 J	2.5 J	0.75 - 0.84	1.10	2.50	10SS0201
COPPER	3/3	4.5 J	11.9	---	7.17	7.17	10SS0201
IRON	3/3	7270 J	44600	---	19948	19948	10SS0201
LEAD	3/3	13.4	82.4	---	53.7	53.7	10SS0201
MAGNESIUM	3/3	90.9 J	167 J	---	133	133	10SS0302-D
MANGANESE	3/3	13.3	124	---	59.3	59.3	10SS0201
MERCURY	2/3	0.08 J	0.12 J	0.09 - 0.18	0.0892	0.100	10SS0201
NICKEL	2/3	1.9 J	4.2 J	3 - 3.2	2.55	3.05	10SS0201
POTASSIUM	2/3	185 J	299 J	154 - 171	151	189	10SS0302-D
SELENIUM	1/3	0.67 J	0.67 J	0.47 - 0.53	0.316	0.468	10SS0302-D
SILVER	2/3	0.46 J	1 J	0.36 - 0.51	0.559	0.730	10SS0201
SODIUM	2/3	182 J	212 J	208 - 210	166	197	10SS0503
VANADIUM	3/3	18.8 J	104	---	48.8	48.8	10SS0201
ZINC	3/3	17.2	27.3	---	23.9	23.9	10SS0201
Miscellaneous Parameter (mg/kg)							
CYANIDE	1/3	0.49 J	0.49 J	0.1 - 0.11	0.198	0.490	10SS0503

APPENDIX TABLE A-2-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Normal Statistics											Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Median	Standard Deviation	Coefficient of Variation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)															
2-HEXANONE	11	1	9%	4.00	4.00	5.45	4.00	5.50	0.522	0.096	-2.362	Shapiro-Wilk	Undefined	4.00	Maximum Detected Concentration
TOTAL XYLENES	11	1	9%	1.00	1.00	4.20	1.00	5.50	1.73	0.411	-0.591	Shapiro-Wilk	Undefined	1.00	Maximum Detected Concentration
Semivolatile Organics (ug/kg)															
ACENAPHTHENE	11	2	18%	40.0	110	219	75.0	185	198	0.903	2.96	Shapiro-Wilk	Undefined	110	Maximum Detected Concentration
ANTHRACENE	11	3	27%	54.0	270	237	175	185	193	0.817	2.90	Shapiro-Wilk	Undefined	270	Maximum Detected Concentration
BENZO(A)ANTHRACENE	11	8	73%	42.0	1400	327	380	185	419	1.28	2.05	Shapiro-Wilk	Lognormal	796	95% Chebyshev(MVUE) UCL
BENZO(A)PYRENE	11	6	55%	45.0	2500	425	627	185	711	1.67	2.97	Shapiro-Wilk	Lognormal	945	95% Chebyshev(MVUE) UCL
BENZO(B)FLUORANTHENE	11	8	73%	62.0	2500	450	550	175	725	1.61	2.70	Shapiro-Wilk	Lognormal	1005	95% Chebyshev(MVUE) UCL
BENZO(G,H,I)PERYLENE	11	2	18%	260	3800	520	2030	185	1088	2.09	3.31	Shapiro-Wilk	Undefined	1043	Non-Parametric UCL
BENZO(K)FLUORANTHENE	11	7	64%	62.0	2300	405	532	185	651	1.61	2.95	Shapiro-Wilk	Lognormal	855	95% Chebyshev(MVUE) UCL
BIS(2-ETHYLHEXYL)PHTHA	11	7	64%	57.0	1720	347	352	185	498	1.43	2.56	Shapiro-Wilk	Lognormal	790	H-UCL
BUTYL BENZYL PHTHALAT	11	4	36%	40.0	85.0	194	57.0	183	211	1.09	2.76	Shapiro-Wilk	Lognormal	85.0	Maximum Detected Concentration
CHRYSENE	11	9	82%	40.0	1600	357	395	170	494	1.38	2.01	Shapiro-Wilk	Lognormal	896	95% Chebyshev(MVUE) UCL
DIBENZO(A,H)ANTHRACEN	11	2	18%	170	1000	257	585	185	246	0.958	3.31	Shapiro-Wilk	Undefined	370	Non-Parametric UCL
DIBENZOFURAN	11	1	9%	52.0	52.0	228	52.0	185	194	0.852	3.04	Shapiro-Wilk	Undefined	52.0	Maximum Detected Concentration
DIETHYL PHTHALATE	11	1	9%	96.0	96.0	233	96.0	185	190	0.815	3.18	Shapiro-Wilk	Undefined	96.0	Maximum Detected Concentration
FLUORANTHENE	11	8	73%	59.0	1480	451	551	185	539	1.19	1.38	Shapiro-Wilk	Lognormal	1117	95% Chebyshev(MVUE) UCL
FLUORENE	11	1	9%	120	120	234	120	185	189	0.807	3.25	Shapiro-Wilk	Undefined	120	Maximum Detected Concentration
INDENO(1,2,3-CD)PYRENE	11	4	36%	57.0	3200	451	919	185	913	2.03	3.30	Shapiro-Wilk	Undefined	879	Non-Parametric UCL
PHENANTHRENE	11	6	55%	36.0	740	305	301	185	290	0.953	1.06	Shapiro-Wilk	Lognormal	740	Maximum Detected Concentration
PYRENE	11	9	82%	45.0	1800	445	503	185	584	1.31	1.62	Shapiro-Wilk	Lognormal	1177	95% Chebyshev(MVUE) UCL
Pesticides PCBs (ug/kg)															
4,4'-DDD	11	1	9%	4.40	4.40	15.3	4.40	9.00	23.8	1.56	2.98	Shapiro-Wilk	Lognormal	4.40	Maximum Detected Concentration
4,4'-DDE	11	1	9%	37.0	37.0	17.5	37.0	9.00	24.8	1.42	2.40	Shapiro-Wilk	Lognormal	37.0	Maximum Detected Concentration
4,4'-DDT	11	7	64%	2.10	35.0	13.5	17.0	9.50	11.0	0.816	1.30	Shapiro-Wilk	Lognormal	34.3	H-UCL
ALPHA-CHLORDANE	11	2	18%	1.10	5.20	64.8	3.15	5.20	126	1.94	2.88	Shapiro-Wilk	Lognormal	5.20	Maximum Detected Concentration
AROCLOR-1254	11	5	45%	51.0	365	141	229	95.0	117	0.826	0.906	Shapiro-Wilk	Normal/Lognormal	363	95% Chebyshev(MVUE) UCL
AROCLOR-1260	11	2	18%	49.0	60.0	128	54.5	60.0	242	1.90	3.20	Shapiro-Wilk	Undefined	60.0	Maximum Detected Concentration
DIELDRIN	11	1	9%	19.0	19.0	15.9	19.0	9.00	23.9	1.51	2.84	Shapiro-Wilk	Lognormal	19.0	Maximum Detected Concentration
GAMMA-CHLORDANE	11	1	9%	6.40	6.40	65.3	6.40	6.40	126	1.93	2.89	Shapiro-Wilk	Lognormal	6.40	Maximum Detected Concentration
HEPTACHLOR	11	1	9%	5.20	5.20	7.98	5.20	4.70	11.9	1.50	2.99	Shapiro-Wilk	Lognormal	5.20	Maximum Detected Concentration
HEPTACHLOR EPOXIDE	11	1	9%	2.40	2.40	7.72	2.40	4.65	12.0	1.56	2.99	Shapiro-Wilk	Lognormal	2.40	Maximum Detected Concentration
Inorganics (mg/kg)															
ALUMINUM	11	11	100%	7425	37000	16673	16673	11300	9717	0.583	1.14	Shapiro-Wilk	Lognormal	24433	H-UCL
ARSENIC	11	11	100%	2.55	8.80	4.78	4.78	4.10	2.03	0.425	0.700	Shapiro-Wilk	Normal/Lognormal	5.89	Student-t
BARIUM	11	11	100%	7.50	191	30.9	30.9	9.70	53.6	1.73	3.18	Shapiro-Wilk	Undefined	57.0	Non-Parametric UCL
BERYLLIUM	11	9	82%	0.080	0.260	0.171	0.149	0.130	0.124	0.726	2.08	Shapiro-Wilk	Lognormal	0.260	Maximum Detected Concentration
CADMIUM	11	7	64%	0.500	2.40	1.01	1.30	0.770	0.718	0.714	1.39	Shapiro-Wilk	Undefined	1.34	Non-Parametric UCL
CALCIUM	11	11	100%	157	20500	2629	2629	1050	5951	2.26	3.27	Shapiro-Wilk	Lognormal	5286	95% Chebyshev(MVUE) UCL
CHROMIUM	11	11	100%	10.1	31.9	19.3	19.3	18.0	7.20	0.374	0.599	Shapiro-Wilk	Normal/Lognormal	23.2	Student-t
COBALT	11	10	91%	0.805	2.40	1.77	1.45	1.42	1.19	0.670	2.27	Shapiro-Wilk	Lognormal	2.40	Maximum Detected Concentration
COPPER	11	10	91%	5.20	24.2	10.5	11.3	10.4	5.89	0.561	1.19	Shapiro-Wilk	Normal/Lognormal	16.9	H-UCL
IRON	11	11	100%	6650	23800	13130	13130	10000	5661	0.431	0.767	Shapiro-Wilk	Normal/Lognormal	16223	Student-t
LEAD	11	11	100%	8.60	47.8	27.2	27.2	29.3	13.8	0.507	0.056	Shapiro-Wilk	Normal/Lognormal	44.6	H-UCL
MAGNESIUM	11	11	100%	77.7	5755	676	676	123	1687	2.50	3.30	Shapiro-Wilk	Undefined	1492	Non-Parametric UCL
MANGANESE	11	11	100%	13.1	389	84.4	84.4	57.1	104	1.23	3.00	Shapiro-Wilk	Lognormal	165	H-UCL
MERCURY	11	5	45%	0.010	0.200	0.065	0.080	0.050	0.049	0.748	2.39	Shapiro-Wilk	Lognormal	0.119	H-UCL

APPENDIX TABLE A-2-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

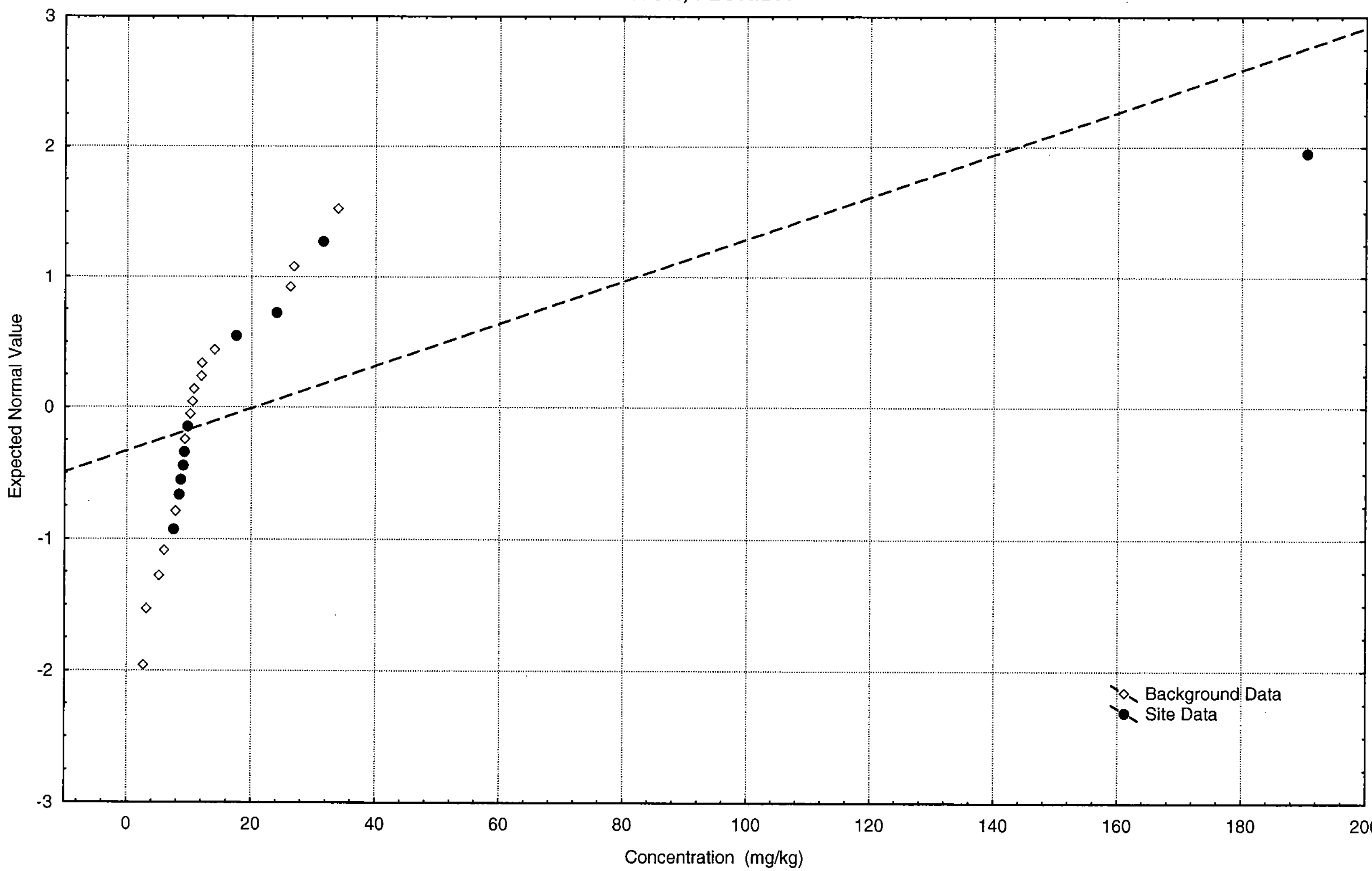
Chemical	Normal Statistics											Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Median	Standard Deviation	Coefficient of Variation	Skewness	Distribution Test	Distribution		
NICKEL	**11**	**7**	**64%**	**2.00**	**7.00**	**4.01**	**4.71**	**4.00**	**1.83**	**0.456**	**0.066**	**Shapiro-Wilk**	**Normal/Lognormal**	6.13	H-UCL
POTASSIUM	**11**	**5**	**45%**	**69.4**	**299**	**155**	**153**	**103**	**136**	**0.875**	**2.00**	**Shapiro-Wilk**	**Undefined**	221	Non-Parametric UCL
SELENIUM	**11**	**1**	**9%**	**0.290**	**0.290**	**0.377**	**0.290**	**0.335**	**0.124**	**0.330**	**-0.177**	**Shapiro-Wilk**	**Undefined**	0.290	Maximum Detected Concentration
SODIUM	11	8	73%	160	387	309	237	289	140	0.453	0.506	Shapiro-Wilk	Lognormal	387	Maximum Detected Concentration
THALLIUM	**11**	**1**	**9%**	**0.130**	**0.130**	**0.603**	**0.130**	**0.370**	**0.386**	**0.640**	**0.104**	**Shapiro-Wilk**	**Undefined**	0.130	Maximum Detected Concentration
VANADIUM	11	11	100%	18.8	63.4	33.8	33.8	25.0	14.8	0.439	0.870	Shapiro-Wilk	Normal/Lognormal	41.9	Student-t
ZINC	11	10	91%	11.2	705	95.1	104	35.9	204	2.14	3.23	Shapiro-Wilk	Lognormal	239	95% Chebyshev(MVUE) UCL
Miscellaneous Parameters (mg/kg)															
CYANIDE	**11**	**5**	**45%**	**0.110**	**0.165**	**0.157**	**0.135**	**0.150**	**0.044**	**0.277**	**0.928**	**Shapiro-Wilk**	**Normal/Lognormal**	**0.165**	**Maximum Detected Concentration**
Petroleum Hydrocarbon (mg/kg)															
TOTAL PETROLEUM HYDRC	6	6	100%	3.30	666	179	179	71.2	248	1.39	2.06	Shapiro-Wilk	Lognormal	666	Maximum Detected Concentration

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

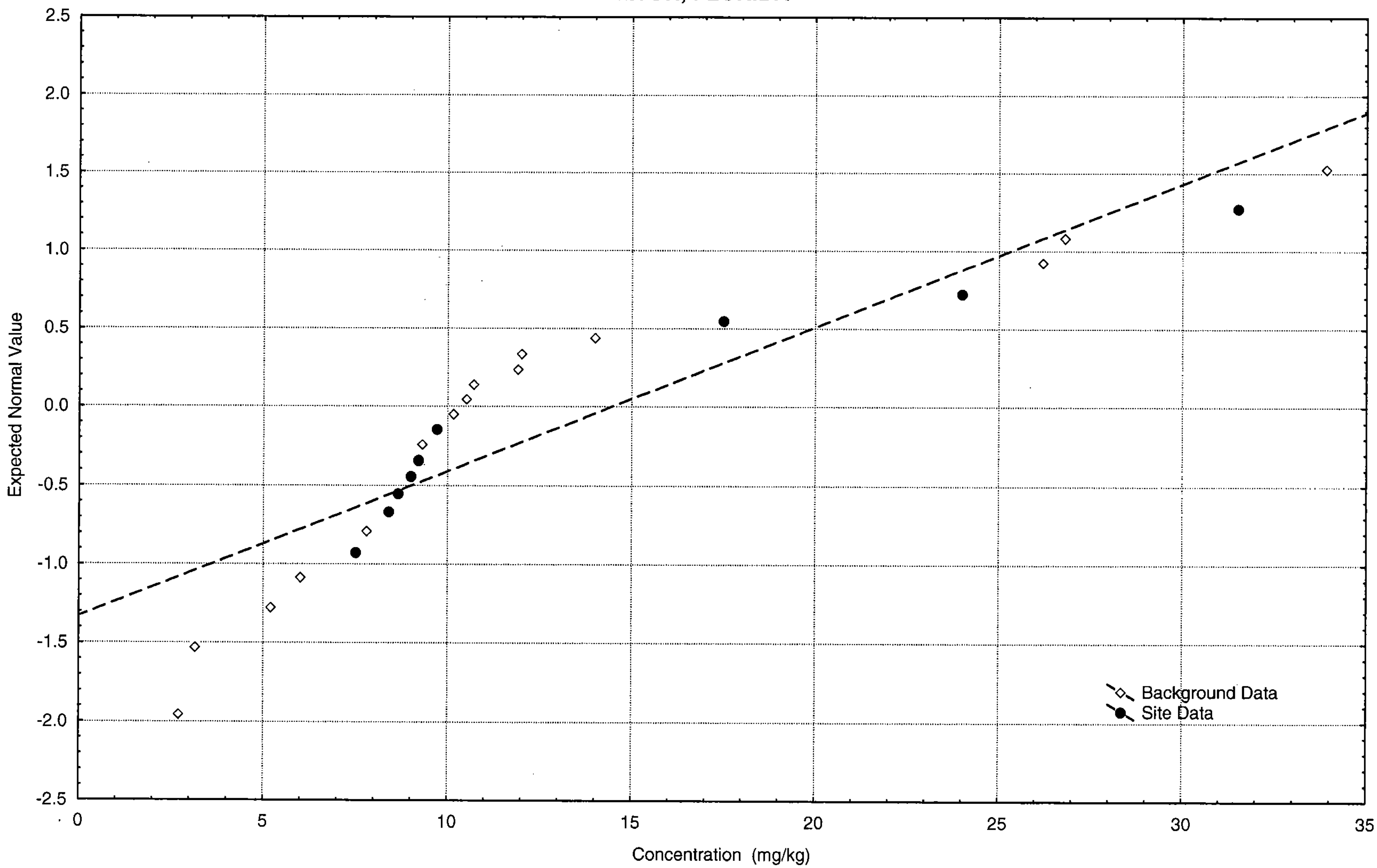
TABLE A-2-8
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 10 SURFACE SOIL																			
CHROMIUM	10/11	15/15	25/26	4%	PASS	31.9	16.3	19.3	6.12	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	38.2	0.00000219	**YES**	---	**YES**
COPPER	10/11	12/15	22/26	15%	PASS	24.2	8.5	10.5	3.97	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	21.0	0.000119	**YES**	---	**YES**

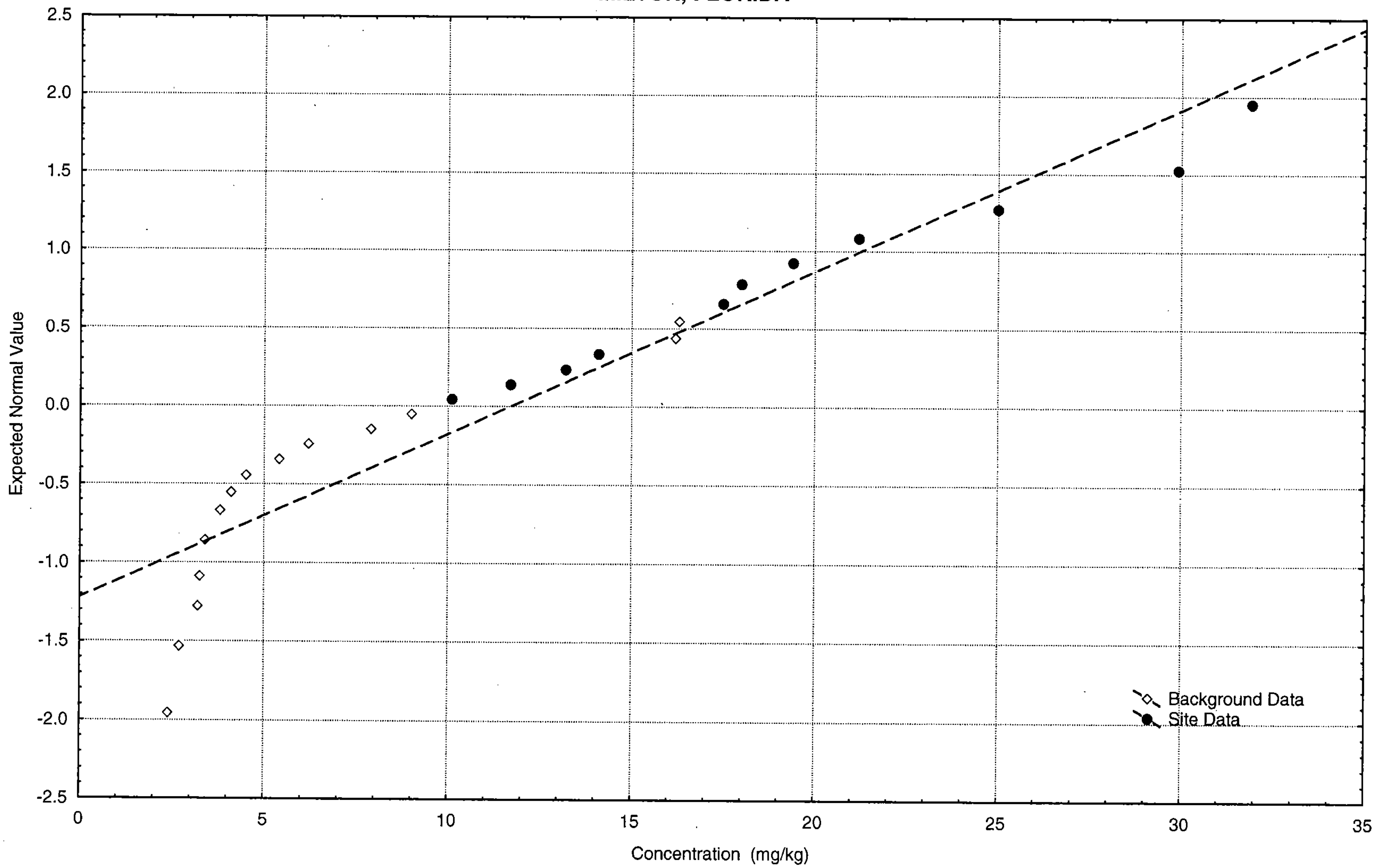
APPENDIX FIGURE A-2-1
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



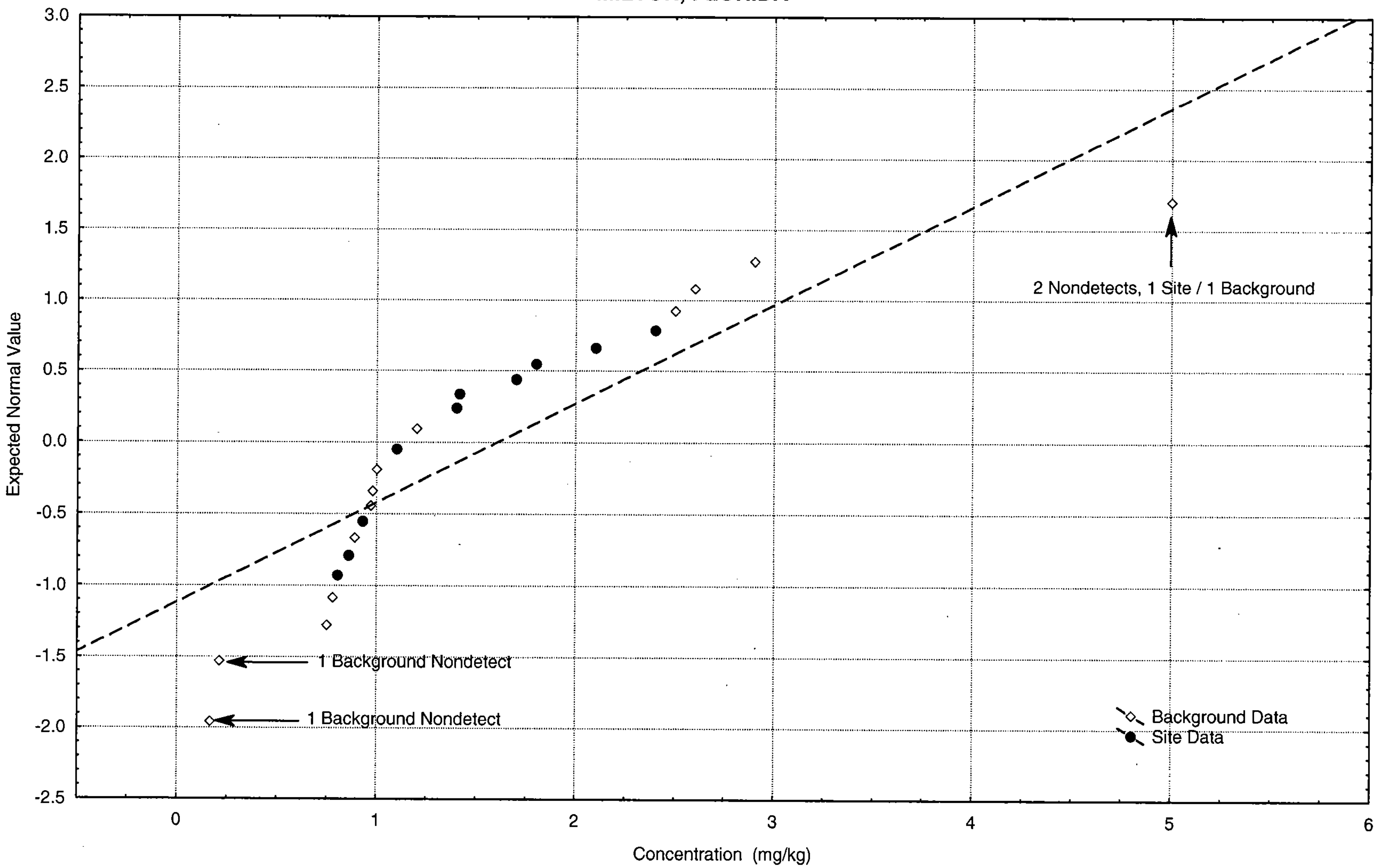
APPENDIX FIGURE A-2-2
NORMAL PROBABILITY PLOT - BARIUM (excluding 10-S001) - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



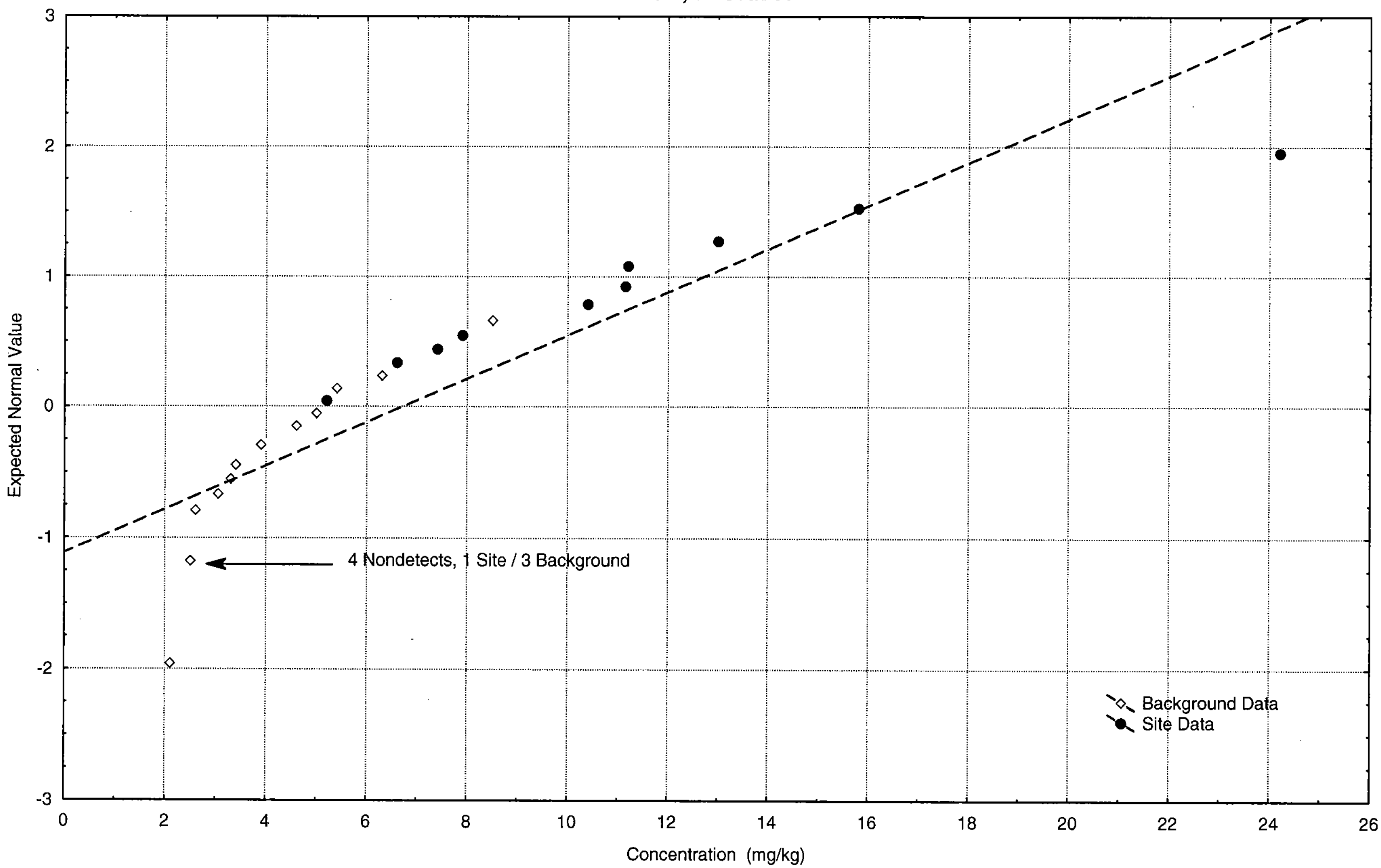
APPENDIX FIGURE A-2-3
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



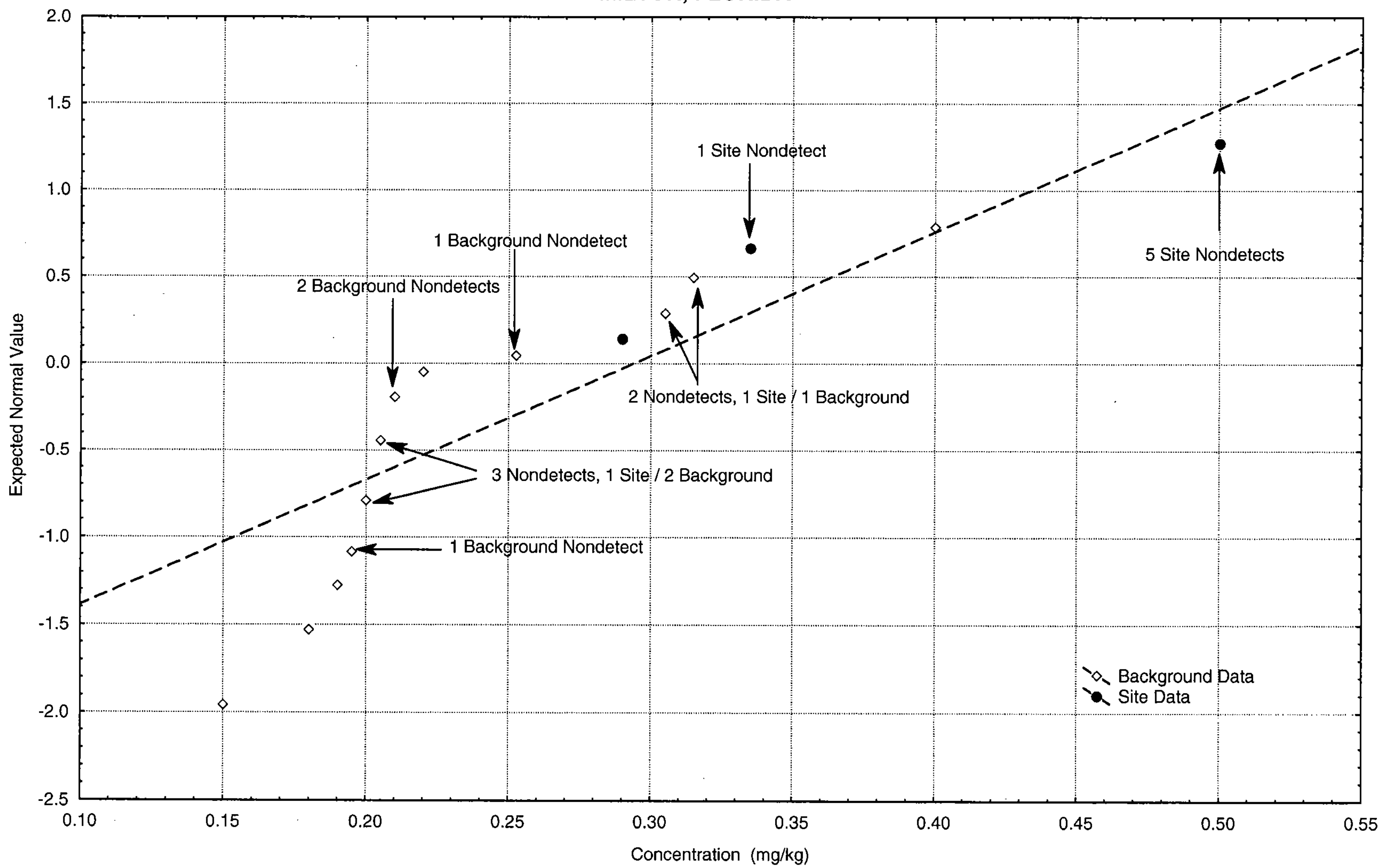
APPENDIX FIGURE A-2-4
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



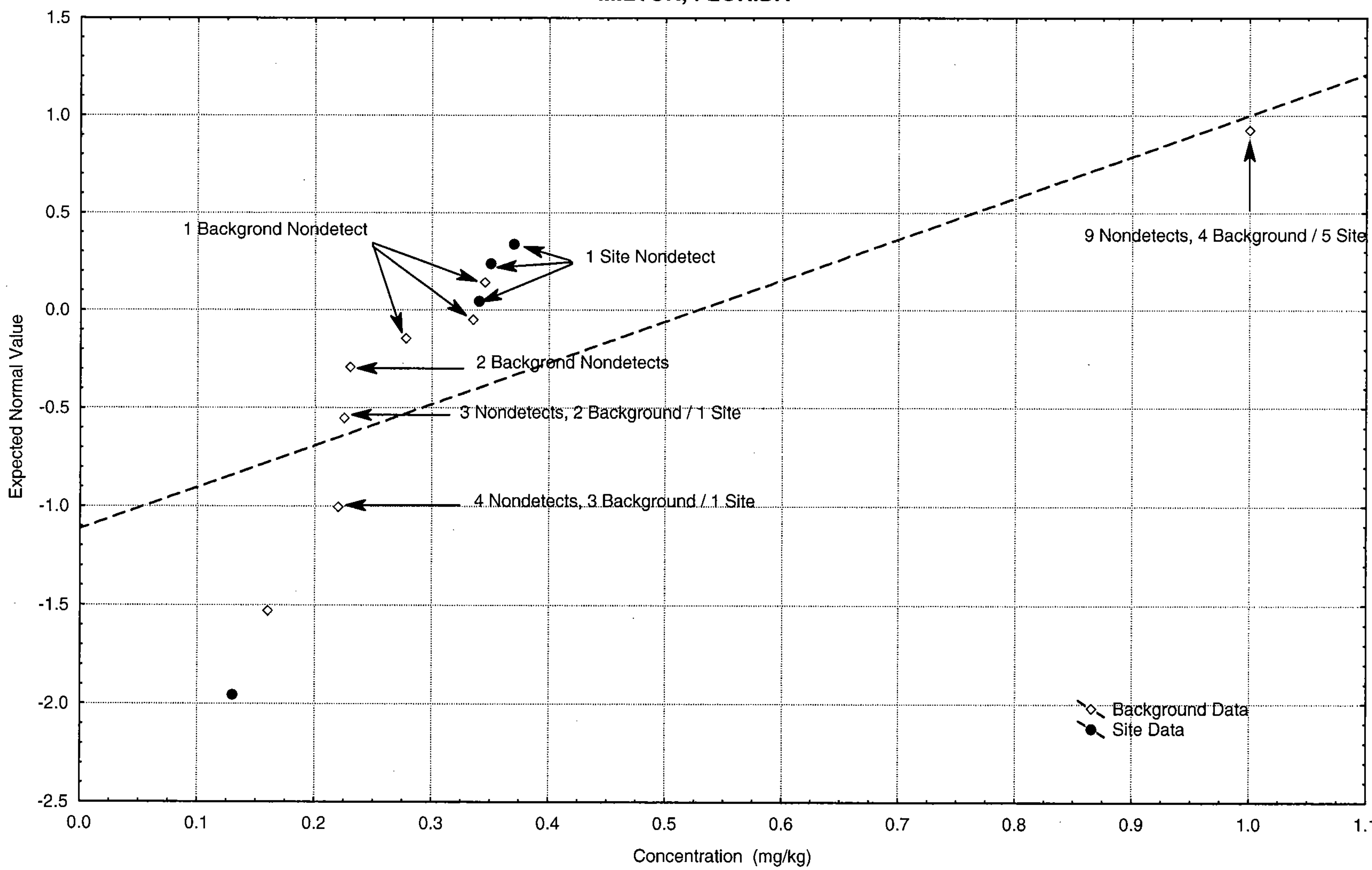
APPENDIX FIGURE A-2-5
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



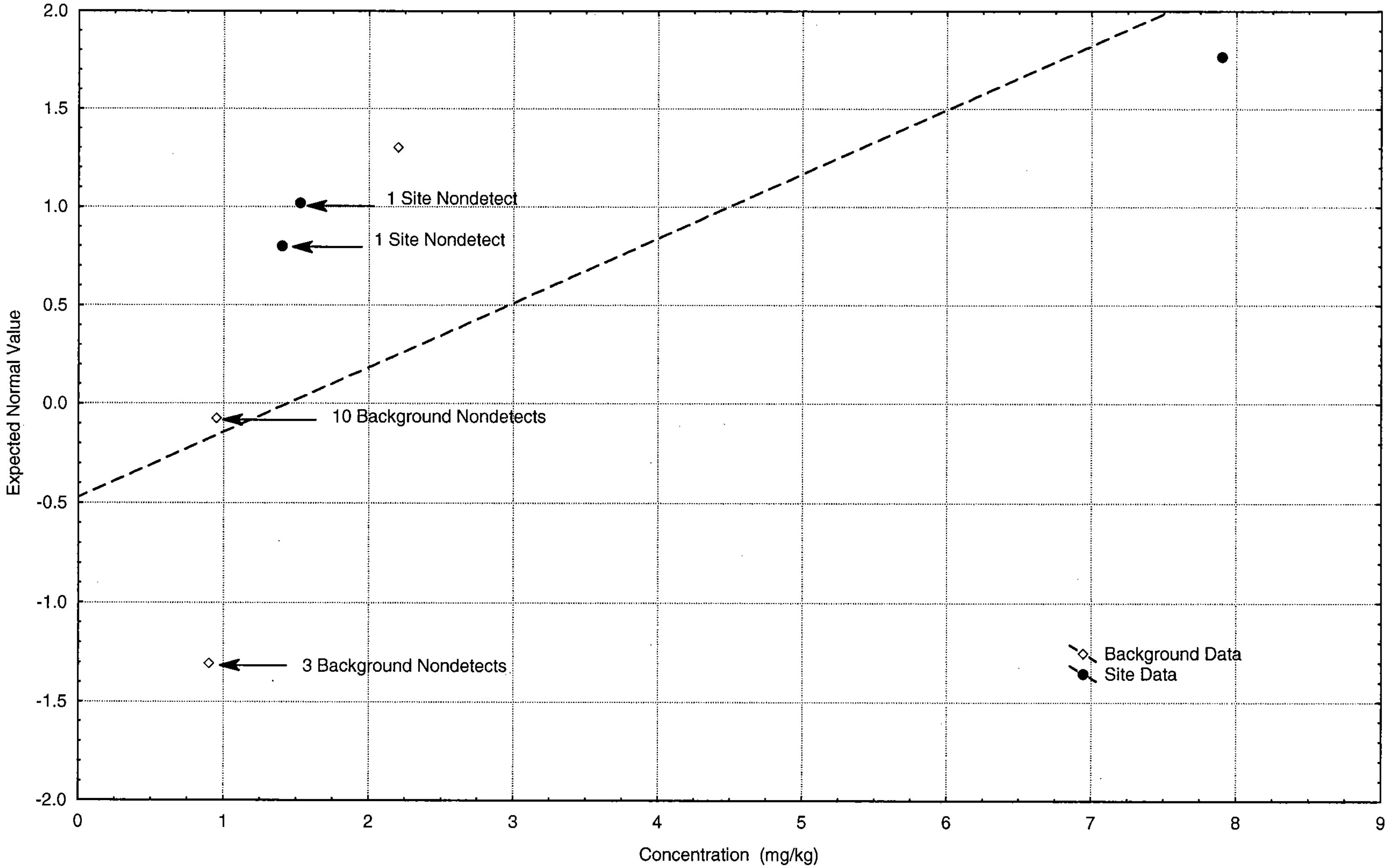
APPENDIX FIGURE A-2-6
NORMAL PROBABILITY PLOT - SELENIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



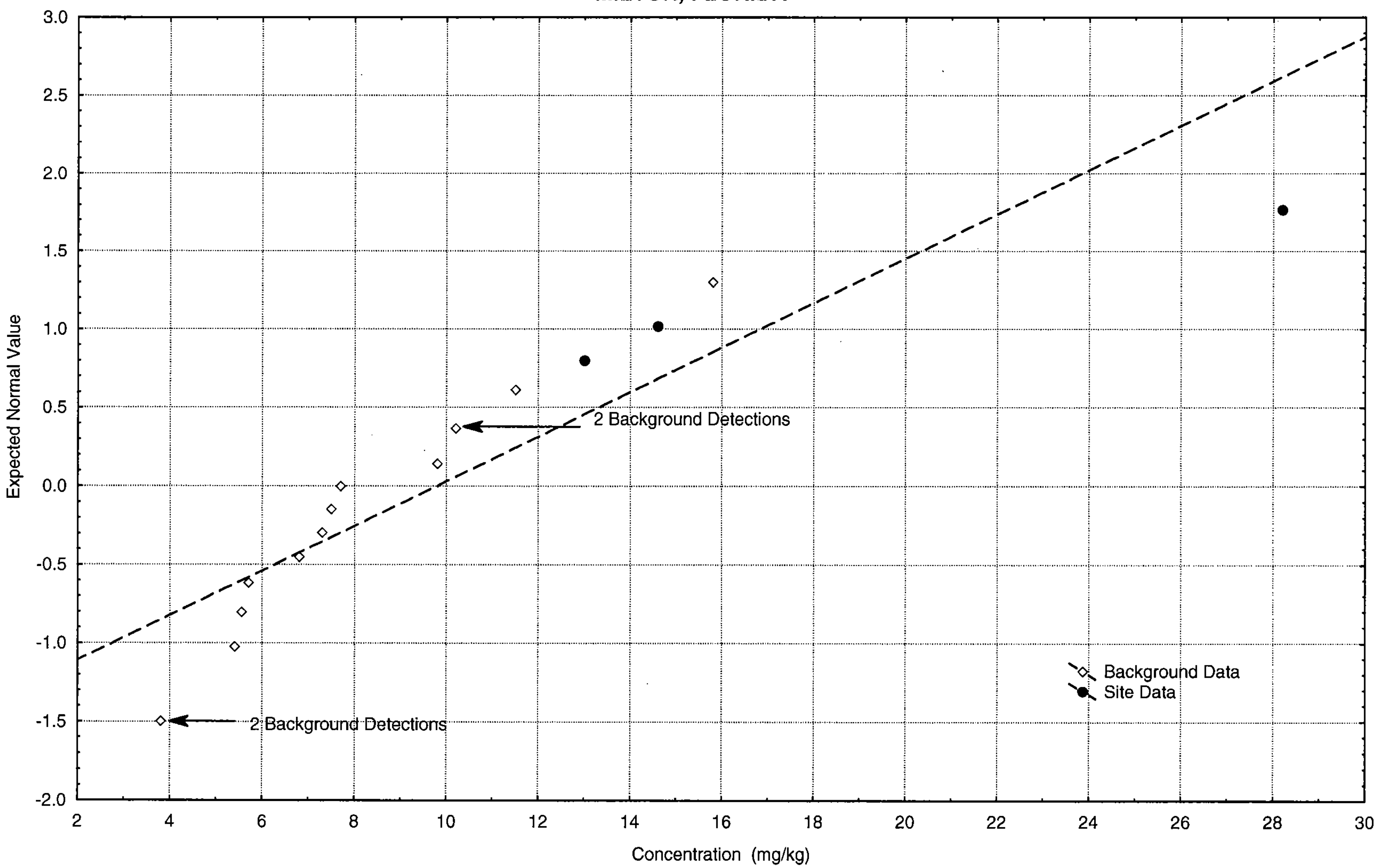
APPENDIX FIGURE A-2-7
NORMAL PROBABILITY PLOT - THALLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



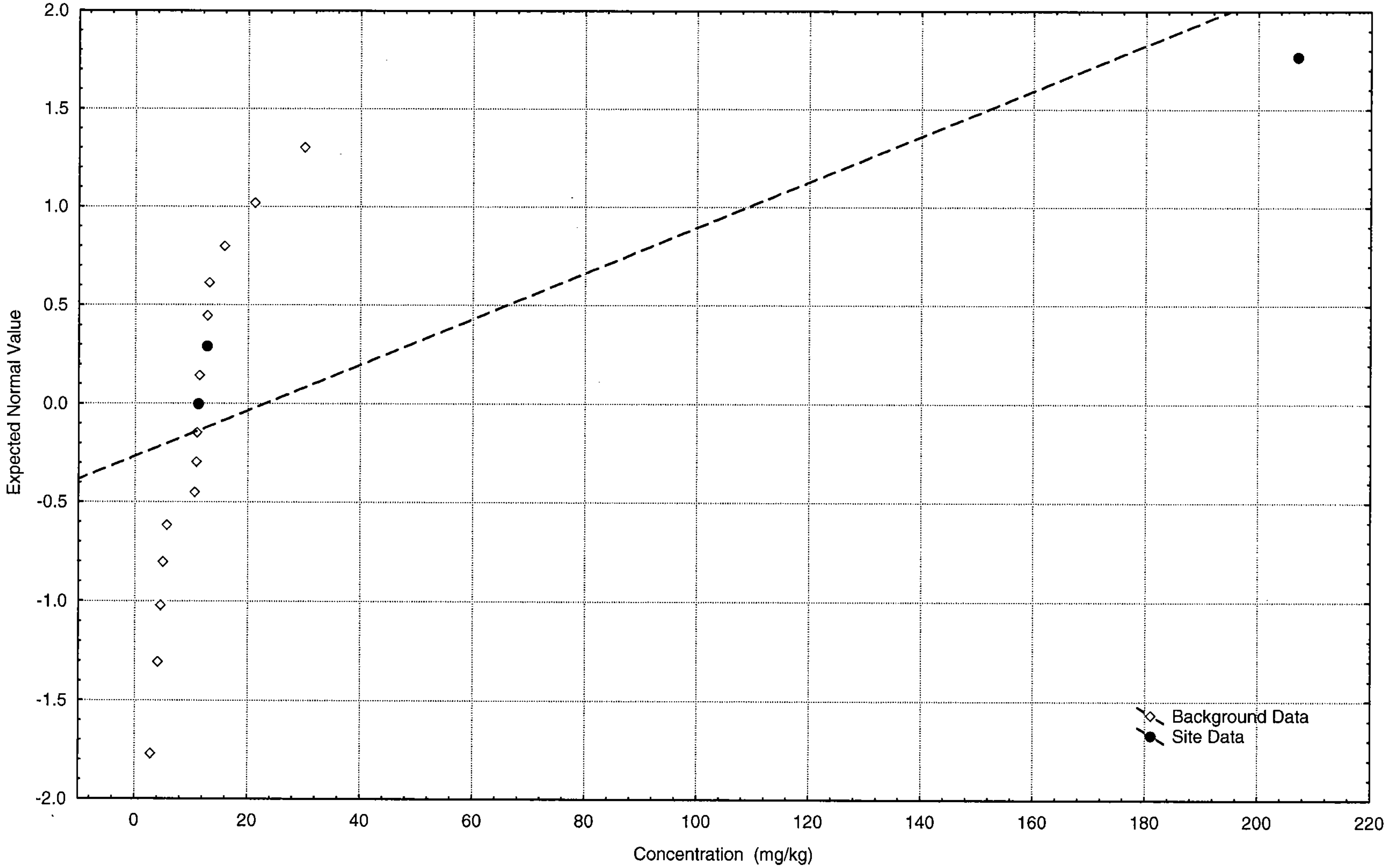
APPENDIX FIGURE A-2-8
NORMAL PROBABILITY PLOT - ANTIMONY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



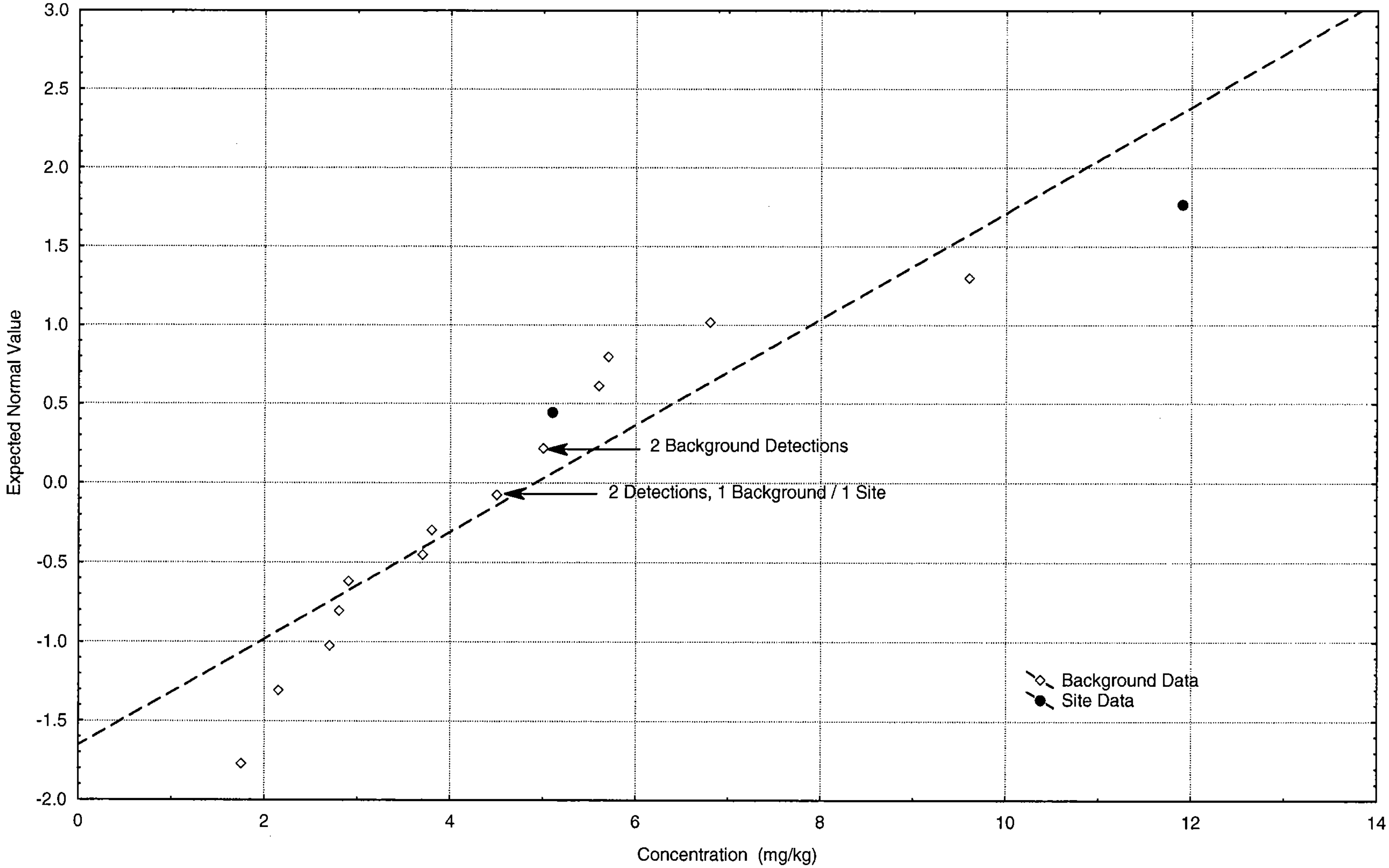
APPENDIX FIGURE A-2-9
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-2-10
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-2-11
NORMAL PROBABILITY PLOT - COPPER - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.3

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**	**0011**
LOCATION	**11-SL-01**	**11-SL-01**	**11-SL-01**	**11-SL-02**	**11-SL-03**	**11-SL-05**	**11SO01**	**11SO02**	**11SO03**	**11SO04**	**11SO05**	**11SO06**
NSAMPLE	**11-SL-01**	**11-SL-01-AVG**	**11-SL-01-D**	**11-SL-02**	**11-SL-03**	**11-SL-05**	**11SO0101**	**11SO0201**	**11SO0301**	**11SO0401**	**11SO0501**	**11SO0601**
SAMPLE	**11-SL-01**	**11-SL-01-AVG**	**11-SL-01A**	**11-SL-02**	**11-SL-03**	**11-SL-05**	**11S00101**	**11S00201**	**11S00301**	**11S00401**	**11S00501**	**11S00601**
SUBMATRIX	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**
SACODE	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**
DEPTH RANGE	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
STATUS	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SAMPLE DATE	**8/18/1992**	**8/18/1992**	**8/18/1992**	**8/18/1992**	**8/18/1992**	**8/18/1992**	**1/6/1996**	**1/6/1996**	**1/6/1996**	**1/6/1996**	**1/6/1996**	**1/7/1996**
COLLECTION METHOD	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 UJ	11 UJ	11 U	11 U	11 U	
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
1,1-DICHLOROETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
1,1-DICHLOROETHENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
1,2-DICHLOROETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
1,2-DICHLOROPROPANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
2-BUTANONE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	
2-HEXANONE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	
4-METHYL-2-PENTANONE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 UJ	11 U	11 U	11 U	
ACETONE	11 UJ	11 UJ	11 UJ	100 J	11 UJ	11 UJ	12 U	11 U	11 U	11 U	11 U	
BENZENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
BROMODICHLOROMETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
BROMOFORM	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
BROMOMETHANE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	
CARBON DISULFIDE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
CARBON TETRACHLORIDE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
CHLOROBENZENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
CHLORODIBROMOMETHANE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
CHLOROETHANE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	
CHLOROFORM	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
CHLOROMETHANE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
ETHYLBENZENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
METHYLENE CHLORIDE	25 UJ	27.5 UJ	30 UJ	47 UJ	22 UJ	12 UJ	11 U	11 U	11 U	11 U	11 U	
STYRENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
TETRACHLOROETHENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
TOLUENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
TOTAL 1,2-DICHLOROETHENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
TOTAL XYLENES	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 UJ	11 U	11 U	11 U	
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 U	11 U	11 U	11 U	11 U	
TRICHLOROETHENE	5 U	5 U	5 U	7 UJ	5 U	5 U	11 UJ	11 UJ	11 U	11 U	11 U	
VINYL ACETATE	11 U	11 U	11 U	13 UJ	11 U	11 U						
VINYL CHLORIDE	11 U	11 U	11 U	13 UJ	11 U	11 U	11 U	11 U	11 U	11 U	11 U	
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
1,2-DICHLOROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
1,3-DICHLOROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
1,4-DICHLOROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11-SL-01	11-SL-01	11-SL-01	11-SL-02	11-SL-03	11-SL-05	11SO01	11SO02	11SO03	11SO04	11SO05	11SO06
NSAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01-D	11-SL-02	11-SL-03	11-SL-05	11SO0101	11SO0201	11SO0301	11SO0401	11SO0501	11SO0601
SAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01A	11-SL-02	11-SL-03	11-SL-05	11S00101	11S00201	11S00301	11S00401	11S00501	11S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/7/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
2,4,6-TRICHLOROPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2,4-DICHLOROPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2,4-DIMETHYLPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2,4-DINITROPHENOL	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
2,4-DINITROTOLUENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2,6-DINITROTOLUENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2-CHLORONAPHTHALENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2-CHLOROPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2-METHYLNAPHTHALENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2-METHYLPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
2-NITROANILINE	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
2-NITROPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
3,3'-DICHLOROBENZIDINE	730 U	730 U	730 U	8100 U	730 U	700 U	370 U	360 U	370 U	370 U	380 U	
3-NITROANILINE	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
4-BROMOPHENYL PHENYL ETHER	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
4-CHLORO-3-METHYLPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
4-CHLOROANILINE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
4-METHYLPHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
4-NITROANILINE	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
4-NITROPHENOL	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
ACENAPHTHENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
ACENAPHTHYLENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
ANTHRACENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZO(A)ANTHRACENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZO(A)PYRENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZO(B)FLUORANTHENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZO(G,H,I)PERYLENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZO(K)FLUORANTHENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BENZOIC ACID	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U						
BENZYL ALCOHOL	360 UJ	365 UJ	370 UJ	4000 UJ	370 UJ	350 UJ						
BIS(2-CHLOROETHOXY)METHANE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BIS(2-CHLOROETHYL)ETHER	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	130 J	71 J	52 J	81 J	
BUTYL BENZYL PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
CHRYSENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
DI-N-BUTYL PHTHALATE	360 UJ	365 UJ	370 UJ	4000 U	370 UJ	350 U	370 U	360 U	370 U	370 U	380 U	
DI-N-OCTYL PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
DIBENZO(A,H)ANTHRACENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11-SL-01	11-SL-01	11-SL-01	11-SL-02	11-SL-03	11-SL-05	11SO01	11SO02	11SO03	11SO04	11SO05	11SO06
NSAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01-D	11-SL-02	11-SL-03	11-SL-05	11SO0101	11SO0201	11SO0301	11SO0401	11SO0501	11SO0601
SAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01A	11-SL-02	11-SL-03	11-SL-05	11S00101	11S00201	11S00301	11S00401	11S00501	11S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/7/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
DIETHYL PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
DIMETHYL PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
FLUORANTHENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
FLUORENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
HEXACHLOROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
HEXACHLOROBUTADIENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
HEXACHLOROCYCLOPENTADIENE	360 UJ	365 UJ	370 UJ	4000 UJ	370 UJ	350 UJ	370 U	360 U	370 U	370 U	380 U	
HEXACHLOROETHANE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
INDENO(1,2,3-CD)PYRENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
ISOPHORONE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
N-NITROSO-DI-N-PROPYLAMINE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
N-NITROSODIPHENYLAMINE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
NAPHTHALENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
NITROBENZENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
PENTACHLOROPHENOL	1800 U	1800 U	1800 U	20000 U	1800 U	1700 U	930 U	910 U	940 U	940 U	950 U	
PHENANTHRENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
PHENOL	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
PYRENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
Pesticides PCBs (ug/kg)												
4,4'-DDD	18 U	18 U	18 U	140 J	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	
4,4'-DDE	18 U	18 U	18 U	88 J	2.5 J	64 J	3.7 U	19 J	5.3	3.7 U	2.1	
4,4'-DDT	18 U	18 U	18 U	530 J	30 J	45 J	3.7 U	27 J	6.8	6.8	2.3	
ALDRIN	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	0.96 J	1.9 U	1.9 U	2 U	
ALPHA-BHC	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	1.9 UJ	1.9 U	1.9 U	2 U	
ALPHA-CHLORDANE	88 U	88.5 U	89 U	62 J	180 U	310 J	1.9 U	150 J	1.9 U	1.9 U	2 U	
AROCLOR-1016	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	37 U	36 UJ	37 U	37 U	38 U	
AROCLOR-1221	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	75 U	74 UJ	76 U	76 U	77 U	
AROCLOR-1232	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	37 U	36 UJ	37 U	37 U	38 U	
AROCLOR-1242	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	37 U	36 UJ	37 U	37 U	38 U	
AROCLOR-1248	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	37 U	36 UJ	37 U	37 U	38 U	
AROCLOR-1254	180 U	180 U	180 U	9800 UJ	360 U	6800 U	37 U	36 UJ	37 U	37 U	38 U	
AROCLOR-1260	180 U	180 U	180 U	9800 UJ	360 U	6800 U	37 U	36 UJ	37 U	37 U	38 U	
BETA-BHC	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	1.9 UJ	1.9 U	1.9 U	2 U	
DELTA-BHC	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	1.9 UJ	1.9 U	1.9 U	2 U	
DIELDRIN	18 U	18 U	18 U	210 J	5.1 J	44 J	3.7 U	20 J	23	23	13	
ENDOSULFAN I	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	
ENDOSULFAN II	18 U	18 U	18 U	980 UJ	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	
ENDOSULFAN SULFATE	18 U	18 U	18 U	980 UJ	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	
ENDRIN	18 U	18 U	18 U	980 UJ	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11-SL-01	11-SL-01	11-SL-01	11-SL-02	11-SL-03	11-SL-05	11SO01	11SO02	11SO03	11SO04	11SO05	11SO06
NSAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01-D	11-SL-02	11-SL-03	11-SL-05	11SO0101	11SO0201	11SO0301	11SO0401	11SO0501	11SO0601
SAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01A	11-SL-02	11-SL-03	11-SL-05	11S00101	11S00201	11S00301	11S00401	11S00501	11S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/7/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	18 U	18 U	18 U	980 UJ	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	
GAMMA-BHC (LINDANE)	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	1.9 UJ	1.9 U	1.9 U	2 U	
GAMMA-CHLORDANE	88 U	88.5 U	89 U	54 J	180 U	260 J	1.9 U	100 J	1.9 U	1.9 U	2 U	
HEPTACHLOR	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	4.8 J	1.9 U	1.9 U	2 U	
HEPTACHLOR EPOXIDE	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	8.8 J	1.9 U	1.9 U	2 U	
METHOXYCHLOR	88 U	88.5 U	89 U	4900 UJ	180 U	3400 U	19 U	19 UJ	19 U	19 U	20 U	
TOXAPHENE	180 U	180 U	180 U	9800 UJ	360 U	6800 U	190 U	190 UJ	190 U	190 U	200 U	
TOTAL DDT	0 U	0 U	0 U	758 J	32.5 J	109 J	0 U	46 J	12.1	6.8	4.4	
TOTAL DDT HALFND	27	27	27	758 J	50.5 J	449 J	5.55	47.8 J	13.95	10.5	6.3	
TOTAL PCBs	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	0 UJ	0 U	0 U	0 U	
TOTAL PCBs HALFND	400	401.25	402.5	22050	810	15300	148.5	145	149	149	152.5	
Inorganics (mg/kg)												
ALUMINUM	9790	10295	10800	10800	9380	2110	9660	5670	5070	5070	10700	
ANTIMONY	2.7 U	2.7 U	2.7 U	3.5 J	2.7 U	2.6 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	
ARSENIC	2 J	1.8 J	1.6 J	3.8	2.1 J	0.93 J	2.1 J	1.6 J	2.2 J	2.2 J	2.7	
BARIUM	16.4 J	17.1 J	17.8 J	96	13.1 J	6.2 J	15.3 J	8.6 J	4.6 J	12.8 J	11.7 J	
BERYLLIUM	0.13 J	0.115 J	0.1 J	0.14 J	0.05 UJ	0.05 UJ	0.1 J	0.08 J	0.05 J	0.05 J	0.09 J	
CADMIUM	0.6 U	0.6 U	0.6 U	0.67 U	0.6 U	0.58 U	1 U	0.28 J	1 U	1 U	0.24 J	
CALCIUM	183 J	184.5 J	186 J	1790	375 J	331 J	206 J	332 J	249 J	249 J	483 J	
CHROMIUM	6.9	7.15	7.4	19.6	7.7	2.7	6.7	5	6	7.8	11.8	
COBALT	1.2 J	1.4 J	1.6 J	3.4 J	1.2 J	0.33 UJ	2 J	0.94 J	10 U	10 U	10 U	
COPPER	5.2 J	5.15 J	5.1 J	19.4	5.3 J	8.1	3.7 J	5.5	5 UJ	5 UJ	6.3	
IRON	5810	5835	5860	11700	5500	1500	5630	3480	4310	4310	6690	
LEAD	5.7	5.6	5.5	2230	22.3	8.6	5.2	25.2	40.3	40.3	16.5	19.3 J
MAGNESIUM	108 J	125 J	142 J	1260	99.7 J	65.1 J	137 J	122 J	54.2 J	54.2 J	139 J	
MANGANESE	275	280	285	230	182	31.4	194	46.7	34.2	97.3	122	
MERCURY	0.05 J	0.05 J	0.05 J	0.06 J	0.04 J	0.05 J	0.1 U	0.1 U	0.1 U	0.1 U	0.08	
NICKEL	2.4 U	2.4 U	2.4 U	10	2.3 U	2.3 U	1.6 J	1.8 J	8 U	8 U	2 J	
POTASSIUM	132 U	102.5 J	139 J	166 J	132 U	133 J	115 J	109 J	108 J	62.1 J	90.3 J	
SELENIUM	0.46 U	0.46 U	0.46 U	0.51 U	0.46 U	0.45 U	0.16 J	1 U	1 U	1 U	1 U	
SILVER	1.2 J	0.935 J	0.67 J	1.9 J	0.55 J	0.79 J	2 U	2 U	2 U	2 U	2 U	
SODIUM	177 J	173 J	169 J	307 J	184 J	177 J	183 J	173 J	168 J	168 J	160 J	
THALLIUM	0.35 U	0.35 U	0.35 U	0.39 U	0.35 U	0.34 U	2 U	2 U	2 U	2 U	2 U	
VANADIUM	14.9	15.3	15.7	20.3	14.6	4.4 J	14.4	9.3 J	11.9	11.9	17.8	
ZINC	8.8 J	9.35 J	9.9 J	260	47.8	21.5	5.7	23.8	8	8	11.2	
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.24 U	0.24 U	0.24 U	0.27 U	0.24 U	0.24 U	0.09 J	0.19 J	0.13 J	0.09 J	0.09 J	
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS							7	53.1	9.3	8.6	11.6	

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO06	11SO06	11SO07	11SO08	11SO09	11SO10	11SO11	11SO12	11SO13	11SO14	11SO15	11SO16
NSAMPLE	11SO0601-AVG	11SO0601-D	11SO0701	11SO0801	11SO0901	11SO1001	11SO1101	11SO1201	11SO1301	11SO1401	11SO1501	11SO1601
SAMPLE	11SO0601-AVG	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301	11SO1401	11SO1501	11SO1601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE												
1,1,2,2-TETRACHLOROETHANE												
1,1,2-TRICHLOROETHANE												
1,1-DICHLOROETHANE												
1,1-DICHLOROETHENE												
1,2-DICHLOROETHANE												
1,2-DICHLOROPROPANE												
2-BUTANONE												
2-HEXANONE												
4-METHYL-2-PENTANONE												
ACETONE												
BENZENE												
BROMODICHLOROMETHANE												
BROMOFORM												
BROMOMETHANE												
CARBON DISULFIDE												
CARBON TETRACHLORIDE												
CHLOROBENZENE												
CHLORODIBROMOMETHANE												
CHLOROETHANE												
CHLOROFORM												
CHLOROMETHANE												
CIS-1,3-DICHLOROPROPENE												
ETHYLBENZENE												
METHYLENE CHLORIDE												
STYRENE												
TETRACHLOROETHENE												
TOLUENE												
TOTAL 1,2-DICHLOROETHENE												
TOTAL XYLENES												
TRANS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
VINYL ACETATE												
VINYL CHLORIDE												
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE												
1,2-DICHLOROBENZENE												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO06	11SO06	11SO07	11SO08	11SO09	11SO10	11SO11	11SO12	11SO13	11SO14	11SO15	11SO16
NSAMPLE	11SO0601-AVG	11SO0601-D	11SO0701	11SO0801	11SO0901	11SO1001	11SO1101	11SO1201	11SO1301	11SO1401	11SO1501	11SO1601
SAMPLE	11SO0601-AVG	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301	11SO1401	11SO1501	11SO1601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL												
2,4,6-TRICHLOROPHENOL												
2,4-DICHLOROPHENOL												
2,4-DIMETHYLPHENOL												
2,4-DINITROPHENOL												
2,4-DINITROTOLUENE												
2,6-DINITROTOLUENE												
2-CHLORONAPHTHALENE												
2-CHLOROPHENOL												
2-METHYLNAPHTHALENE												
2-METHYLPHENOL												
2-NITROANILINE												
2-NITROPHENOL												
3,3'-DICHLOROBENZIDINE												
3-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
4-BROMOPHENYL PHENYL ETHER												
4-CHLORO-3-METHYLPHENOL												
4-CHLOROANILINE												
4-METHYLPHENOL												
4-NITROANILINE												
4-NITROPHENOL												
ACENAPHTHENE												
ACENAPHTHYLENE												
ANTHRACENE												
BENZO(A)ANTHRACENE												
BENZO(A)PYRENE												
BENZO(B)FLUORANTHENE												
BENZO(G,H,I)PERYLENE												
BENZO(K)FLUORANTHENE												
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE												
BIS(2-CHLOROETHYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE												
BUTYL BENZYL PHTHALATE												
CHRYSENE												
DI-N-BUTYL PHTHALATE												
DI-N-OCTYL PHTHALATE												
DIBENZO(A,H)ANTHRACENE												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO06	11SO06	11SO07	11SO08	11SO09	11SO10	11SO11	11SO12	11SO13	11SO14	11SO15	11SO16
NSAMPLE	11SO0601-AVG	11SO0601-D	11SO0701	11SO0801	11SO0901	11SO1001	11SO1101	11SO1201	11SO1301	11SO1401	11SO1501	11SO1601
SAMPLE	11SO0601-AVG	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301	11SO1401	11SO1501	11SO1601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN												
DIETHYL PHTHALATE												
DIMETHYL PHTHALATE												
FLUORANTHENE												
FLUORENE												
HEXACHLOROBENZENE												
HEXACHLOROBUTADIENE												
HEXACHLOROCYCLOPENTADIENE												
HEXACHLOROETHANE												
INDENO(1,2,3-CD)PYRENE												
ISOPHORONE												
N-NITROSO-DI-N-PROPYLAMINE												
N-NITROSODIPHENYLAMINE												
NAPHTHALENE												
NITROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE												
PHENOL												
PYRENE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-BHC												
ALPHA-CHLORDANE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC												
DELTA-BHC												
DIELDRIN												
ENDOSULFAN I												
ENDOSULFAN II												
ENDOSULFAN SULFATE												
ENDRIN												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO06	11SO06	11SO07	11SO08	11SO09	11SO10	11SO11	11SO12	11SO13	11SO14	11SO15	11SO16
NSAMPLE	11SO0601-AVG	11SO0601-D	11SO0701	11SO0801	11SO0901	11SO1001	11SO1101	11SO1201	11SO1301	11SO1401	11SO1501	11SO1601
SAMPLE	11SO0601-AVG	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301	11SO1401	11SO1501	11SO1601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE												
GAMMA-BHC (LINDANE)												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
METHOXYCHLOR												
TOXAPHENE												
TOTAL DDT												
TOTAL DDT HALFND												
TOTAL PCBs												
TOTAL PCBs HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	22.15 J	25	18.7 J	16.5 J	16.8 J	23.3 J	16.2 J	74.8	43.5	104	107	8.8
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
THALLIUM												
VANADIUM												
ZINC												
Miscellaneous Parameters (mg/kg)												
CYANIDE												
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO17	11SO18	11SO19	11SO20	11SO21	11SO22	11SO22	11SO22	11SO23	11SO24	11SO25	11SO26
NSAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE												
1,1,2,2-TETRACHLOROETHANE												
1,1,2-TRICHLOROETHANE												
1,1-DICHLOROETHANE												
1,1-DICHLOROETHENE												
1,2-DICHLOROETHANE												
1,2-DICHLOROPROPANE												
2-BUTANONE												
2-HEXANONE												
4-METHYL-2-PENTANONE												
ACETONE												
BENZENE												
BROMODICHLOROMETHANE												
BROMOFORM												
BROMOMETHANE												
CARBON DISULFIDE												
CARBON TETRACHLORIDE												
CHLOROBENZENE												
CHLORODIBROMOMETHANE												
CHLOROETHANE												
CHLOROFORM												
CHLOROMETHANE												
CIS-1,3-DICHLOROPROPENE												
ETHYLBENZENE												
METHYLENE CHLORIDE												
STYRENE												
TETRACHLOROETHENE												
TOLUENE												
TOTAL 1,2-DICHLOROETHENE												
TOTAL XYLENES												
TRANS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
VINYL ACETATE												
VINYL CHLORIDE												
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE												
1,2-DICHLOROBENZENE												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO17	11SO18	11SO19	11SO20	11SO21	11SO22	11SO22	11SO22	11SO23	11SO24	11SO25	11SO26
NSAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL												
2,4,6-TRICHLOROPHENOL												
2,4-DICHLOROPHENOL												
2,4-DIMETHYLPHENOL												
2,4-DINITROPHENOL												
2,4-DINITROTOLUENE												
2,6-DINITROTOLUENE												
2-CHLORONAPHTHALENE												
2-CHLOROPHENOL												
2-METHYLNAPHTHALENE												
2-METHYLPHENOL												
2-NITROANILINE												
2-NITROPHENOL												
3,3'-DICHLOROBENZIDINE												
3-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
4-BROMOPHENYL PHENYL ETHER												
4-CHLORO-3-METHYLPHENOL												
4-CHLOROANILINE												
4-METHYLPHENOL												
4-NITROANILINE												
4-NITROPHENOL												
ACENAPHTHENE												
ACENAPHTHYLENE												
ANTHRACENE												
BENZO(A)ANTHRACENE												
BENZO(A)PYRENE												
BENZO(B)FLUORANTHENE												
BENZO(G,H,I)PERYLENE												
BENZO(K)FLUORANTHENE												
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE												
BIS(2-CHLOROETHYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE												
BUTYL BENZYL PHTHALATE												
CHRYSENE												
DI-N-BUTYL PHTHALATE												
DI-N-OCTYL PHTHALATE												
DIBENZO(A,H)ANTHRACENE												

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO17	11SO18	11SO19	11SO20	11SO21	11SO22	11SO22	11SO22	11SO23	11SO24	11SO25	11SO26
NSAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN												
DIETHYL PHTHALATE												
DIMETHYL PHTHALATE												
FLUORANTHENE												
FLUORENE												
HEXACHLOROBENZENE												
HEXACHLOROBUTADIENE												
HEXACHLOROCYCLOPENTADIENE												
HEXACHLOROETHANE												
INDENO(1,2,3-CD)PYRENE												
ISOPHORONE												
N-NITROSO-DI-N-PROPYLAMINE												
N-NITROSODIPHENYLAMINE												
NAPHTHALENE												
NITROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE												
PHENOL												
PYRENE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-BHC												
ALPHA-CHLORDANE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC												
DELTA-BHC												
DIELDRIN												
ENDOSULFAN I												
ENDOSULFAN II												
ENDOSULFAN SULFATE												
ENDRIN												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO17	11SO18	11SO19	11SO20	11SO21	11SO22	11SO22	11SO22	11SO23	11SO24	11SO25	11SO26
NSAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE												
GAMMA-BHC (LINDANE)												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
METHOXYCHLOR												
TOXAPHENE												
TOTAL DDT												
TOTAL DDT HALFND												
TOTAL PCBs												
TOTAL PCBs HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	19.8	23.9	36.2	58.4	29.4	15.4	16.2	17	17.9	41.7	23.2	161
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
THALLIUM												
VANADIUM												
ZINC												
Miscellaneous Parameters (mg/kg)												
CYANIDE												
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO26	11SO26	11SO27	11SO28	11SO29	11SO30	11SO31	11SO32	11SO33	11SO34	11SO35	11SO36
NSAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE												
1,1,2,2-TETRACHLOROETHANE												
1,1,2-TRICHLOROETHANE												
1,1-DICHLOROETHANE												
1,1-DICHLOROETHENE												
1,2-DICHLOROETHANE												
1,2-DICHLOROPROPANE												
2-BUTANONE												
2-HEXANONE												
4-METHYL-2-PENTANONE												
ACETONE												
BENZENE												
BROMODICHLOROMETHANE												
BROMOFORM												
BROMOMETHANE												
CARBON DISULFIDE												
CARBON TETRACHLORIDE												
CHLOROBENZENE												
CHLORODIBROMOMETHANE												
CHLOROETHANE												
CHLOROFORM												
CHLOROMETHANE												
CIS-1,3-DICHLOROPROPENE												
ETHYLBENZENE												
METHYLENE CHLORIDE												
STYRENE												
TETRACHLOROETHENE												
TOLUENE												
TOTAL 1,2-DICHLOROETHENE												
TOTAL XYLENES												
TRANS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
VINYL ACETATE												
VINYL CHLORIDE												
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE												
1,2-DICHLOROBENZENE												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO26	11SO26	11SO27	11SO28	11SO29	11SO30	11SO31	11SO32	11SO33	11SO34	11SO35	11SO36
NSAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL												
2,4,6-TRICHLOROPHENOL												
2,4-DICHLOROPHENOL												
2,4-DIMETHYLPHENOL												
2,4-DINITROPHENOL												
2,4-DINITROTOLUENE												
2,6-DINITROTOLUENE												
2-CHLORONAPHTHALENE												
2-CHLOROPHENOL												
2-METHYLNAPHTHALENE												
2-METHYLPHENOL												
2-NITROANILINE												
2-NITROPHENOL												
3,3'-DICHLOROBENZIDINE												
3-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
4-BROMOPHENYL PHENYL ETHER												
4-CHLORO-3-METHYLPHENOL												
4-CHLOROANILINE												
4-METHYLPHENOL												
4-NITROANILINE												
4-NITROPHENOL												
ACENAPHTHENE												
ACENAPHTHYLENE												
ANTHRACENE												
BENZO(A)ANTHRACENE												
BENZO(A)PYRENE												
BENZO(B)FLUORANTHENE												
BENZO(G,H,I)PERYLENE												
BENZO(K)FLUORANTHENE												
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE												
BIS(2-CHLOROETHYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE												
BUTYL BENZYL PHTHALATE												
CHRYSENE												
DI-N-BUTYL PHTHALATE												
DI-N-OCTYL PHTHALATE												
DIBENZO(A,H)ANTHRACENE												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO26	11SO26	11SO27	11SO28	11SO29	11SO30	11SO31	11SO32	11SO33	11SO34	11SO35	11SO36
NSAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN												
DIETHYL PHTHALATE												
DIMETHYL PHTHALATE												
FLUORANTHENE												
FLUORENE												
HEXACHLOROBENZENE												
HEXACHLOROBUTADIENE												
HEXACHLOROCYCLOPENTADIENE												
HEXACHLOROETHANE												
INDENO(1,2,3-CD)PYRENE												
ISOPHORONE												
N-NITROSO-DI-N-PROPYLAMINE												
N-NITROSODIPHENYLAMINE												
NAPHTHALENE												
NITROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE												
PHENOL												
PYRENE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-BHC												
ALPHA-CHLORDANE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC												
DELTA-BHC												
DIELDRIN												
ENDOSULFAN I												
ENDOSULFAN II												
ENDOSULFAN SULFATE												
ENDRIN												

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO26	11SO26	11SO27	11SO28	11SO29	11SO30	11SO31	11SO32	11SO33	11SO34	11SO35	11SO36
NSAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE												
GAMMA-BHC (LINDANE)												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
METHOXYCHLOR												
TOXAPHENE												
TOTAL DDT												
TOTAL DDT HALFND												
TOTAL PCBs												
TOTAL PCBs HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	170.5	180	9.3	16.1	68.6	31.2	17.3 J	8.8	7 J	79 J	126 J	8.9 J
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
THALLIUM												
VANADIUM												
ZINC												
Miscellaneous Parameters (mg/kg)												
CYANIDE												
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO37	11SO38	11SO41	11SO42	11SO43	11SO44	11SO44	11SO44	11SO45	11SO48	11SO49
NSAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	6/2/1999	6/2/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE											
1,1,2,2-TETRACHLOROETHANE											
1,1,2-TRICHLOROETHANE											
1,1-DICHLOROETHANE											
1,1-DICHLOROETHENE											
1,2-DICHLOROETHANE											
1,2-DICHLOROPROPANE											
2-BUTANONE											
2-HEXANONE											
4-METHYL-2-PENTANONE											
ACETONE											
BENZENE											
BROMODICHLOROMETHANE											
BROMOFORM											
BROMOMETHANE											
CARBON DISULFIDE											
CARBON TETRACHLORIDE											
CHLOROBENZENE											
CHLORODIBROMOMETHANE											
CHLOROETHANE											
CHLOROFORM											
CHLOROMETHANE											
CIS-1,3-DICHLOROPROPENE											
ETHYLBENZENE											
METHYLENE CHLORIDE											
STYRENE											
TETRACHLOROETHENE											
TOLUENE											
TOTAL 1,2-DICHLOROETHENE											
TOTAL XYLENES											
TRANS-1,3-DICHLOROPROPENE											
TRICHLOROETHENE											
VINYL ACETATE											
VINYL CHLORIDE											
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE											
1,2-DICHLOROBENZENE											
1,3-DICHLOROBENZENE											
1,4-DICHLOROBENZENE											

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO37	11SO38	11SO41	11SO42	11SO43	11SO44	11SO44	11SO44	11SO45	11SO48	11SO49
NSAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	6/2/1999	6/2/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL											
2,4,6-TRICHLOROPHENOL											
2,4-DICHLOROPHENOL											
2,4-DIMETHYLPHENOL											
2,4-DINITROPHENOL											
2,4-DINITROTOLUENE											
2,6-DINITROTOLUENE											
2-CHLORONAPHTHALENE											
2-CHLOROPHENOL											
2-METHYLNAPHTHALENE											
2-METHYLPHENOL											
2-NITROANILINE											
2-NITROPHENOL											
3,3'-DICHLOROBENZIDINE											
3-NITROANILINE											
4,6-DINITRO-2-METHYLPHENOL											
4-BROMOPHENYL PHENYL ETHER											
4-CHLORO-3-METHYLPHENOL											
4-CHLOROANILINE											
4-METHYLPHENOL											
4-NITROANILINE											
4-NITROPHENOL											
ACENAPHTHENE											
ACENAPHTHYLENE											
ANTHRACENE											
BENZO(A)ANTHRACENE											
BENZO(A)PYRENE										360 U	350 U
BENZO(B)FLUORANTHENE											
BENZO(G,H,I)PERYLENE											
BENZO(K)FLUORANTHENE											
BENZOIC ACID											
BENZYL ALCOHOL											
BIS(2-CHLOROETHOXY)METHANE											
BIS(2-CHLOROETHYL)ETHER											
BIS(2-ETHYLHEXYL)PHTHALATE											
BUTYL BENZYL PHTHALATE											
CHRYSENE											
DI-N-BUTYL PHTHALATE											
DI-N-OCTYL PHTHALATE											
DIBENZO(A,H)ANTHRACENE											

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO37	11SO38	11SO41	11SO42	11SO43	11SO44	11SO44	11SO44	11SO45	11SO48	11SO49
NSAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	6/2/1999	6/2/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN											
DIETHYL PHTHALATE											
DIMETHYL PHTHALATE											
FLUORANTHENE											
FLUORENE											
HEXACHLOROBENZENE											
HEXACHLOROBUTADIENE											
HEXACHLOROCYCLOPENTADIENE											
HEXACHLOROETHANE											
INDENO(1,2,3-CD)PYRENE											
ISOPHORONE											
N-NITROSO-DI-N-PROPYLAMINE											
N-NITROSODIPHENYLAMINE											
NAPHTHALENE											
NITROBENZENE											
PENTACHLOROPHENOL											
PHENANTHRENE											
PHENOL											
PYRENE											
Pesticides PCBs (ug/kg)											
4,4'-DDD											
4,4'-DDE										140 U	3.5 U
4,4'-DDT										140 U	3.5 U
ALDRIN											
ALPHA-BHC											
ALPHA-CHLORDANE										549	21.9
AROCLOR-1016											
AROCLOR-1221											
AROCLOR-1232											
AROCLOR-1242											
AROCLOR-1248											
AROCLOR-1254											
AROCLOR-1260											
BETA-BHC											
DELTA-BHC											
DIELDRIN										92.3	4.4
ENDOSULFAN I											
ENDOSULFAN II											
ENDOSULFAN SULFATE											
ENDRIN											

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO37	11SO38	11SO41	11SO42	11SO43	11SO44	11SO44	11SO44	11SO45	11SO48	11SO49
NSAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	6/2/1999	6/2/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE											
GAMMA-BHC (LINDANE)											
GAMMA-CHLORDANE										678	19.4
HEPTACHLOR										139	1.8 U
HEPTACHLOR EPOXIDE										62.6 J	1.1 J
METHOXYCHLOR											
TOXAPHENE											
TOTAL DDT										0 U	0 U
TOTAL DDT HALFND										140	3.5
TOTAL PCBs											
TOTAL PCBs HALFND											
Inorganics (mg/kg)											
ALUMINUM											
ANTIMONY											
ARSENIC											
BARIUM											
BERYLLIUM											
CADMIUM											
CALCIUM											
CHROMIUM											
COBALT											
COPPER											
IRON											
LEAD	6.9 J	666 J	13.6	5.2	7.5	9.9	10.15	10.4	10.9		
MAGNESIUM											
MANGANESE											
MERCURY											
NICKEL											
POTASSIUM											
SELENIUM											
SILVER											
SODIUM											
THALLIUM											
VANADIUM											
ZINC											
Miscellaneous Parameters (mg/kg)											
CYANIDE											
Petroleum Hydrocarbons (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS											8.8 J

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO49	11SO49	11SO50	11SO51	11SS47	11SS47	11SS47
NSAMPLE	11SO4901-AVG	11SO4901-D	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SAMPLE	11SO4901-AVG	11SO5301	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	2 - 2	2 - 2	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	6/2/1999	6/2/1999	6/2/1999	6/2/1999	6/2/1999	9/1/1999	9/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE							
1,1,2,2-TETRACHLOROETHANE							
1,1,2-TRICHLOROETHANE							
1,1-DICHLOROETHANE							
1,1-DICHLOROETHENE							
1,2-DICHLOROETHANE							
1,2-DICHLOROPROPANE							
2-BUTANONE							
2-HEXANONE							
4-METHYL-2-PENTANONE							
ACETONE							
BENZENE							
BROMODICHLOROMETHANE							
BROMOFORM							
BROMOMETHANE							
CARBON DISULFIDE							
CARBON TETRACHLORIDE							
CHLOROBENZENE							
CHLORODIBROMOMETHANE							
CHLOROETHANE							
CHLOROFORM							
CHLOROMETHANE							
CIS-1,3-DICHLOROPROPENE							
ETHYLBENZENE							
METHYLENE CHLORIDE							
STYRENE							
TETRACHLOROETHENE							
TOLUENE							
TOTAL 1,2-DICHLOROETHENE							
TOTAL XYLENES							
TRANS-1,3-DICHLOROPROPENE							
TRICHLOROETHENE							
VINYL ACETATE							
VINYL CHLORIDE							
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE							
1,2-DICHLOROBENZENE							
1,3-DICHLOROBENZENE							
1,4-DICHLOROBENZENE							

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO49	11SO49	11SO50	11SO51	11SS47	11SS47	11SS47
NSAMPLE	11SO4901-AVG	11SO4901-D	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SAMPLE	11SO4901-AVG	11SO5301	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	2 - 2	2 - 2	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	6/2/1999	6/2/1999	6/2/1999	6/2/1999	6/2/1999	9/1/1999	9/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL							
2,4,6-TRICHLOROPHENOL							
2,4-DICHLOROPHENOL							
2,4-DIMETHYLPHENOL							
2,4-DINITROPHENOL							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							
2-CHLORONAPHTHALENE							
2-CHLOROPHENOL							
2-METHYLNAPHTHALENE							
2-METHYLPHENOL							
2-NITROANILINE							
2-NITROPHENOL							
3,3'-DICHLOROBENZIDINE							
3-NITROANILINE							
4,6-DINITRO-2-METHYLPHENOL							
4-BROMOPHENYL PHENYL ETHER							
4-CHLORO-3-METHYLPHENOL							
4-CHLOROANILINE							
4-METHYLPHENOL							
4-NITROANILINE							
4-NITROPHENOL							
ACENAPHTHENE							
ACENAPHTHYLENE							
ANTHRACENE							
BENZO(A)ANTHRACENE							
BENZO(A)PYRENE	350 U	350 U	350 U	3600 U	3600 U	10 U	43
BENZO(B)FLUORANTHENE							
BENZO(G,H,I)PERYLENE							
BENZO(K)FLUORANTHENE							
BENZOIC ACID							
BENZYL ALCOHOL							
BIS(2-CHLOROETHOXY)METHANE							
BIS(2-CHLOROETHYL)ETHER							
BIS(2-ETHYLHEXYL)PHTHALATE							
BUTYL BENZYL PHTHALATE							
CHRYSENE							
DI-N-BUTYL PHTHALATE							
DI-N-OCTYL PHTHALATE							
DIBENZO(A,H)ANTHRACENE							

SITE	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO49	11SO49	11SO50	11SO51	11SS47	11SS47	11SS47
NSAMPLE	11SO4901-AVG	11SO4901-D	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SAMPLE	11SO4901-AVG	11SO5301	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	2 - 2	2 - 2	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	6/2/1999	6/2/1999	6/2/1999	6/2/1999	6/2/1999	9/1/1999	9/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN							
DIETHYL PHTHALATE							
DIMETHYL PHTHALATE							
FLUORANTHENE							
FLUORENE							
HEXACHLOROBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROCYCLOPENTADIENE							
HEXACHLOROETHANE							
INDENO(1,2,3-CD)PYRENE							
ISOPHORONE							
N-NITROSO-DI-N-PROPYLAMINE							
N-NITROSODIPHENYLAMINE							
NAPHTHALENE							
NITROBENZENE							
PENTACHLOROPHENOL							
PHENANTHRENE							
PHENOL							
PYRENE							
Pesticides PCBs (ug/kg)							
4,4'-DDD							
4,4'-DDE	3.5 U	3.5 U	3.5 U	36 U	73 U		
4,4'-DDT	3.5 U	3.5 U	3.5 U	36 U	36.5 J		
ALDRIN							
ALPHA-BHC							
ALPHA-CHLORDANE	21.35	20.8	24.7	198	216		
AROCLOR-1016							
AROCLOR-1221							
AROCLOR-1232							
AROCLOR-1242							
AROCLOR-1248							
AROCLOR-1254							
AROCLOR-1260							
BETA-BHC							
DELTA-BHC							
DIELDRIN	4.15	3.9	3.5	25.3	136		
ENDOSULFAN I							
ENDOSULFAN II							
ENDOSULFAN SULFATE							
ENDRIN							

APPENDIX TABLE A-3-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO49	11SO49	11SO50	11SO51	11SS47	11SS47	11SS47
NSAMPLE	11SO4901-AVG	11SO4901-D	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SAMPLE	11SO4901-AVG	11SO5301	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	2 - 2	2 - 2	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	6/2/1999	6/2/1999	6/2/1999	6/2/1999	6/2/1999	9/1/1999	9/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE							
GAMMA-BHC (LINDANE)							
GAMMA-CHLORDANE	18	16.6	21	170	184		
HEPTACHLOR	1.8 U	1.8 U	1.8 U	18 U	36 U		
HEPTACHLOR EPOXIDE	1.25 J	1.4 J	1.8 U	18.6	19.9 J		
METHOXYCHLOR							
TOXAPHENE							
TOTAL DDT	0 U	0 U	0 U	0 U	36.5 J		
TOTAL DDT HALFND	3.5	3.5	3.5	36	73 J		
TOTAL PCBs							
TOTAL PCBs HALFND							
Inorganics (mg/kg)							
ALUMINUM							
ANTIMONY							
ARSENIC							
BARIUM							
BERYLLIUM							
CADMIUM							
CALCIUM							
CHROMIUM							
COBALT							
COPPER							
IRON							
LEAD							
MAGNESIUM							
MANGANESE							
MERCURY							
NICKEL							
POTASSIUM							
SELENIUM							
SILVER							
SODIUM							
THALLIUM							
VANADIUM							
ZINC							
Miscellaneous Parameters (mg/kg)							
CYANIDE							
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	8.8 J				302 J		

APPENDIX TABLE A-3-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011
LOCATION	TP-11-01	TP-11-02	TP-11-03
NSAMPLE	11SS0101	11SS0202	11SS0303
SAMPLE	11SS0101	11SS0202	11SS0303
SUBMATRIX	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 6	5 - 6	5 - 6
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)			
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	12 U
1,2-DICHLOROPROPANE	11 U	11 U	12 U
2-BUTANONE	11 U	11 U	12 U
2-HEXANONE	11 U	11 U	12 U
4-METHYL-2-PENTANONE	11 U	11 U	12 U
ACETONE	100 J	19 UJ	80 J
BENZENE	11 U	11 U	12 U
BROMODICHLOROMETHANE	11 U	11 U	12 U
BROMOFORM	11 U	11 U	12 U
BROMOMETHANE	11 U	11 U	12 U
CARBON DISULFIDE	11 U	11 U	12 U
CARBON TETRACHLORIDE	11 U	11 U	12 U
CHLOROBENZENE	11 U	11 U	12 U
CHLORODIBROMOMETHANE	11 U	11 U	12 U
CHLOROETHANE	11 U	11 U	12 U
CHLOROFORM	11 U	11 U	12 U
CHLOROMETHANE	11 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U
ETHYLBENZENE	11 U	11 U	12 U
METHYLENE CHLORIDE	18 UJ	12 UJ	31 UJ
STYRENE	11 U	11 U	12 U
TETRACHLOROETHENE	11 U	11 U	12 U
TOLUENE	4 J	11 U	12 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	12 U
TOTAL XYLENES	4 J	4 J	8 J
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U
TRICHLOROETHENE	11 U	11 U	12 U
VINYL CHLORIDE	11 U	11 U	12 U
Semivolatile Organics (ug/kg)			
1,2,4-TRICHLOROBENZENE	380 UJ	370 UJ	4000 U
1,2-DICHLOROBENZENE	380 U	370 U	4000 U
1,3-DICHLOROBENZENE	380 U	370 U	4000 U
1,4-DICHLOROBENZENE	380 U	370 U	4000 U
2,4,5-TRICHLOROPHENOL	920 U	900 U	9800 U

APPENDIX TABLE A-3-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011
LOCATION	TP-11-01	TP-11-02	TP-11-03
NSAMPLE	11SS0101	11SS0202	11SS0303
SAMPLE	11SS0101	11SS0202	11SS0303
SUBMATRIX	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 6	5 - 6	5 - 6
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	380 U	370 U	4000 U
2,4-DICHLOROPHENOL	380 U	370 U	4000 U
2,4-DIMETHYLPHENOL	380 U	370 U	4000 U
2,4-DINITROPHENOL	920 UJ	900 UJ	9800 U
2,4-DINITROTOLUENE	380 U	370 U	4000 U
2,6-DINITROTOLUENE	380 U	370 U	4000 U
2-CHLORONAPHTHALENE	380 U	370 U	4000 U
2-CHLOROPHENOL	380 U	370 U	4000 U
2-METHYLNAPHTHALENE	380 U	370 UJ	4000 U
2-METHYLPHENOL	380 U	370 U	4000 U
2-NITROANILINE	920 U	900 U	9800 U
2-NITROPHENOL	380 U	370 U	4000 U
3,3'-DICHLOROBENZIDINE	380 UJ	370 UJ	4000 UJ
3-NITROANILINE	920 U	900 U	9800 U
4,6-DINITRO-2-METHYLPHENOL	920 UJ	900 UJ	9800 U
4-BROMOPHENYL PHENYL ETHER	380 U	370 U	4000 U
4-CHLORO-3-METHYLPHENOL	380 U	370 U	4000 U
4-CHLOROANILINE	380 U	370 U	4000 U
4-METHYLPHENOL	380 U	370 U	4000 U
4-NITROANILINE	920 U	900 U	9800 U
4-NITROPHENOL	920 U	900 U	9800 U
ACENAPHTHENE	380 U	370 U	4000 U
ACENAPHTHYLENE	380 U	370 U	4000 U
ANTHRACENE	380 U	370 U	4000 U
BENZO(A)ANTHRACENE	380 U	370 U	4000 U
BENZO(A)PYRENE	380 U	370 U	4000 U
BENZO(B)FLUORANTHENE	380 UJ	370 UJ	4000 U
BENZO(G,H,I)PERYLENE	380 U	370 U	4000 U
BENZO(K)FLUORANTHENE	380 U	370 U	4000 U
BIS(2-CHLOROETHOXY)METHANE	380 U	370 U	4000 U
BIS(2-CHLOROETHYL)ETHER	380 U	370 U	4000 U
BIS(2-ETHYLHEXYL)PHTHALATE	100 J	370 U	4000 U
BUTYL BENZYL PHTHALATE	380 U	370 U	4000 U
CHRYSENE	380 U	370 U	4000 U
DI-N-BUTYL PHTHALATE	380 UJ	370 UJ	4000 U
DI-N-OCTYL PHTHALATE	380 U	370 U	4000 U
DIBENZO(A,H)ANTHRACENE	380 U	370 U	4000 U
DIBENZOFURAN	380 U	370 U	4000 U
DIETHYL PHTHALATE	380 U	370 U	4000 U
DIMETHYL PHTHALATE	380 U	370 U	4000 U

APPENDIX TABLE A-3-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011
LOCATION	TP-11-01	TP-11-02	TP-11-03
NSAMPLE	11SS0101	11SS0202	11SS0303
SAMPLE	11SS0101	11SS0202	11SS0303
SUBMATRIX	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 6	5 - 6	5 - 6
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB	GRAB
FLUORANTHENE	380 U	370 U	4000 U
FLUORENE	380 U	370 U	4000 U
HEXACHLOROBENZENE	380 U	370 U	4000 UJ
HEXACHLOROBUTADIENE	380 UJ	370 U	4000 UJ
HEXACHLOROCYCLOPENTADIENE	380 U	370 U	4000 UJ
HEXACHLOROETHANE	380 U	370 U	4000 U
INDENO(1,2,3-CD)PYRENE	380 U	370 U	4000 U
ISOPHORONE	380 U	370 U	4000 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	370 U	4000 U
N-NITROSODIPHENYLAMINE	380 U	370 U	4000 U
NAPHTHALENE	380 U	370 U	4000 U
NITROBENZENE	380 U	370 U	4000 U
PENTACHLOROPHENOL	920 U	900 U	9800 U
PHENANTHRENE	380 U	370 U	4000 U
PHENOL	380 U	370 U	4000 U
PYRENE	380 U	370 U	4000 U
Pesticides PCBs (ug/kg)			
4,4'-DDD	22 J	3.7 U	120
4,4'-DDE	5 J	27	22 J
4,4'-DDT	7.6 U	8.4	28 J
ALDRIN	7 J	1.9 U	21 U
ALPHA-BHC	3.9 U	1.9 U	21 U
ALPHA-CHLORDANE	3.9 U	1.9 U	21 U
AROCLOR-1016	76 U	37 U	400 U
AROCLOR-1221	150 U	75 U	820 U
AROCLOR-1232	76 U	37 U	400 U
AROCLOR-1242	76 U	37 U	400 U
AROCLOR-1248	76 U	37 U	400 U
AROCLOR-1254	260 J	37 U	400 U
AROCLOR-1260	62 J	37 U	400 U
BETA-BHC	3.9 U	1.9 U	21 U
DELTA-BHC	3.9 U	1.9 U	21 U
DIELDRIN	23 J	2 J	33 J
ENDOSULFAN I	3.9 U	1.9 U	21 U
ENDOSULFAN II	7.6 U	3.7 U	40 U
ENDOSULFAN SULFATE	7.6 U	3.7 U	40 U
ENDRIN	7.6 U	3.7 U	40 U
ENDRIN KETONE	7.6 U	3.7 U	40 U
GAMMA-BHC (LINDANE)	3.9 U	1.9 U	21 U
GAMMA-CHLORDANE	3.9 U	1.9 U	21 U

APPENDIX TABLE A-3-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011
LOCATION	TP-11-01	TP-11-02	TP-11-03
NSAMPLE	11SS0101	11SS0202	11SS0303
SAMPLE	11SS0101	11SS0202	11SS0303
SUBMATRIX	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 6	5 - 6	5 - 6
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB	GRAB
HEPTACHLOR	3.9 U	1.9 U	21 U
HEPTACHLOR EPOXIDE	3.9 U	1.9 U	21 U
METHOXYCHLOR	39 U	19 U	210 U
TOXAPHENE	390 U	190 U	2100 U
Inorganics (mg/kg)			
ALUMINUM	17100	19400	11300
ANTIMONY	2.4 U	2.4 U	2.6 U
ARSENIC	3.9	5.5	3.7
BARIUM	14.6 J	10.7 J	28.5 J
BERYLLIUM	0.18 J	0.21 J	0.12 J
CADMIUM	5	0.67 U	6.5
CALCIUM	601 J	766 J	12100
CHROMIUM	19.5	17.2	11.4
COBALT	1.2 J	1.1 J	1.7 J
COPPER	17.2	5.9	6.7
IRON	16800	15600	7780
LEAD	64.4	7.4	109
MAGNESIUM	85.2 J	97 J	311 J
MANGANESE	20.6	41	188
MERCURY	0.11	0.08 J	0.2 J
NICKEL	3.7 J	3.5 J	3.9 J
POTASSIUM	154 U	151 U	161 U
SELENIUM	0.48 U	0.56 J	0.5 U
SILVER	0.46 U	0.45 U	0.48 U
SODIUM	176 J	167 J	189 J
THALLIUM	0.36 U	0.35 U	0.38 U
VANADIUM	34.9	37.5	22.2
ZINC	298	12.8 J	100
Miscellaneous Parameters (mg/kg)			
CYANIDE	0.09 U	0.09 U	0.1 U

APPENDIX TABLE A-3-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**
LOCATION	**11-SL-04**
NSAMPLE	**11-SL-04**
SAMPLE	**11-SL-04**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**8/18/1992**
COLLECTION METHOD	**GRAB**
Volatile Organics (ug/kg)	
1,1,1-TRICHLOROETHANE	5 U
1,1,2,2-TETRACHLOROETHANE	5 U
1,1,2-TRICHLOROETHANE	5 U
1,1-DICHLOROETHANE	5 U
1,1-DICHLOROETHENE	5 U
1,2-DICHLOROETHANE	5 U
1,2-DICHLOROPROPANE	5 U
2-BUTANONE	11 U
2-HEXANONE	11 U
4-METHYL-2-PENTANONE	11 U
ACETONE	11 UJ
BENZENE	5 U
BROMODICHLOROMETHANE	5 U
BROMOFORM	5 U
BROMOMETHANE	11 U
CARBON DISULFIDE	5 U
CARBON TETRACHLORIDE	5 U
CHLOROBENZENE	5 U
CHLORODIBROMOMETHANE	5 U
CHLOROETHANE	11 U
CHLOROFORM	5 U
CHLOROMETHANE	11 U
CIS-1,3-DICHLOROPROPENE	5 U
ETHYLBENZENE	5 U
METHYLENE CHLORIDE	13 UJ
STYRENE	5 U
TETRACHLOROETHENE	5 U
TOLUENE	5 U
TOTAL 1,2-DICHLOROETHENE	5 U
TOTAL XYLENES	5 U
TRANS-1,3-DICHLOROPROPENE	5 U
TRICHLOROETHENE	5 U
VINYL ACETATE	11 U
VINYL CHLORIDE	11 U
Semivolatile Organics (ug/kg)	
1,2,4-TRICHLOROBENZENE	350 U
1,2-DICHLOROBENZENE	350 U
1,3-DICHLOROBENZENE	350 U

APPENDIX TABLE A-3-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**
LOCATION	**11-SL-04**
NSAMPLE	**11-SL-04**
SAMPLE	**11-SL-04**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**8/18/1992**
COLLECTION METHOD	**GRAB**
1,4-DICHLOROBENZENE	350 U
2,4,5-TRICHLOROPHENOL	1700 U
2,4,6-TRICHLOROPHENOL	350 U
2,4-DICHLOROPHENOL	350 U
2,4-DIMETHYLPHENOL	350 U
2,4-DINITROPHENOL	1700 U
2,4-DINITROTOLUENE	350 U
2,6-DINITROTOLUENE	350 U
2-CHLORONAPHTHALENE	350 U
2-CHLOROPHENOL	350 U
2-METHYLNAPHTHALENE	49 J
2-METHYLPHENOL	350 U
2-NITROANILINE	1700 U
2-NITROPHENOL	350 U
3,3'-DICHLOROBENZIDINE	710 U
3-NITROANILINE	1700 U
4,6-DINITRO-2-METHYLPHENOL	1700 U
4-BROMOPHENYL PHENYL ETHER	350 U
4-CHLORO-3-METHYLPHENOL	350 U
4-CHLOROANILINE	350 U
4-METHYLPHENOL	350 U
4-NITROANILINE	1700 U
4-NITROPHENOL	1700 U
ACENAPHTHENE	350 U
ACENAPHTHYLENE	110 J
ANTHRACENE	280 J
BENZO(A)ANTHRACENE	1800
BENZO(A)PYRENE	910
BENZO(B)FLUORANTHENE	710
BENZO(G,H,I)PERYLENE	310 J
BENZO(K)FLUORANTHENE	870
BENZOIC ACID	1700 U
BENZYL ALCOHOL	350 UJ
BIS(2-CHLOROETHOXY)METHANE	350 U
BIS(2-CHLOROETHYL)ETHER	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	540
BUTYL BENZYL PHTHALATE	350 U
CHRYSENE	2500
DI-N-BUTYL PHTHALATE	350 UJ

APPENDIX TABLE A-3-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**
LOCATION	**11-SL-04**
NSAMPLE	**11-SL-04**
SAMPLE	**11-SL-04**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**8/18/1992**
COLLECTION METHOD	**GRAB**
DI-N-OCTYL PHTHALATE	350 U
DIBENZO(A,H)ANTHRACENE	350 U
DIBENZOFURAN	350 U
DIETHYL PHTHALATE	350 U
DIMETHYL PHTHALATE	350 U
FLUORANTHENE	1300
FLUORENE	350 U
HEXACHLOROBENZENE	350 U
HEXACHLOROBUTADIENE	350 U
HEXACHLOROCYCLOPENTADIENE	350 UJ
HEXACHLOROETHANE	350 U
INDENO(1,2,3-CD)PYRENE	230 J
ISOPHORONE	350 U
N-NITROSO-DI-N-PROPYLAMINE	350 U
N-NITROSODIPHENYLAMINE	350 U
NAPHTHALENE	350 U
NITROBENZENE	350 U
PENTACHLOROPHENOL	1700 U
PHENANTHRENE	2100
PHENOL	350 U
PYRENE	3400
Pesticides PCBs (ug/kg)	
4,4'-DDD	86 U
4,4'-DDE	4.9 J
4,4'-DDT	6.7 J
ALDRIN	43 U
ALPHA-BHC	43 U
ALPHA-CHLORDANE	39 J
AROCLOR-1016	430 U
AROCLOR-1221	430 U
AROCLOR-1232	430 U
AROCLOR-1242	430 U
AROCLOR-1248	430 U
AROCLOR-1254	860 U
AROCLOR-1260	860 U
BETA-BHC	43 U
DELTA-BHC	43 U
DIELDRIN	4.9 J
ENDOSULFAN I	43 U

APPENDIX TABLE A-3-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**
LOCATION	**11-SL-04**
NSAMPLE	**11-SL-04**
SAMPLE	**11-SL-04**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**8/18/1992**
COLLECTION METHOD	**GRAB**
ENDOSULFAN II	86 U
ENDOSULFAN SULFATE	86 U
ENDRIN	86 U
ENDRIN KETONE	86 U
GAMMA-BHC (LINDANE)	43 U
GAMMA-CHLORDANE	29 J
HEPTACHLOR	43 U
HEPTACHLOR EPOXIDE	43 U
METHOXYCHLOR	430 U
TOXAPHENE	860 U
Inorganics (mg/kg)	
ALUMINUM	6100
ANTIMONY	2.6 U
ARSENIC	1.5 J
BARIUM	6.3 J
BERYLLIUM	0.05 UJ
CADMIUM	0.58 U
CALCIUM	248 J
CHROMIUM	4.5
COBALT	0.35 J
COPPER	4 J
IRON	3540
LEAD	7.8
MAGNESIUM	82.7 J
MANGANESE	39.4
MERCURY	0.04 J
NICKEL	2.3 U
POTASSIUM	128 U
SELENIUM	0.44 U
SILVER	0.93 J
SODIUM	189 J
THALLIUM	0.34 U
VANADIUM	9.5 J
ZINC	9.4 J
Miscellaneous Parameters (mg/kg)	
CYANIDE	0.23 U

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11-SL-01	11-SL-01	11-SL-01	11-SL-02	11-SL-03	11-SL-05	11SO01	11SO02	11SO03	11SO04	11SO05	11SO06
NSAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01-D	11-SL-02	11-SL-03	11-SL-05	11SO0101	11SO0201	11SO0301	11SO0401	11SO0501	11SO0601
SAMPLE	11-SL-01	11-SL-01-AVG	11-SL-01A	11-SL-02	11-SL-03	11-SL-05	11S00101	11S00201	11S00301	11S00401	11S00501	11S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/6/1996	1/7/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
ACETONE	11 UJ	11 UJ	11 UJ	100 J	11 UJ	11 UJ	12 U	11 U	11 U	11 U	11 U	
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	360 U	370 U	370 U	380 U	
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	365 U	370 U	4000 U	370 U	350 U	370 U	130 J	71 J	52 J	81 J	
Pesticides PCBs (ug/kg)												
4,4'-DDD	18 U	18 U	18 U	140 J	36 U	680 U	3.7 U	3.6 UJ	3.7 U	3.7 U	3.8 U	
4,4'-DDE	18 U	18 U	18 U	88 J	2.5 J	64 J	3.7 U	19 J	5.3	3.7 U	2.1	
4,4'-DDT	18 U	18 U	18 U	530 J	30 J	45 J	3.7 U	27 J	6.8	6.8	2.3	
ALDRIN	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	0.96 J	1.9 U	1.9 U	2 U	
ALPHA-CHLORDANE	88 U	88.5 U	89 U	62 J	180 U	310 J	1.9 U	150 J	1.9 U	1.9 U	2 U	
DIELDRIN	18 U	18 U	18 U	210 J	5.1 J	44 J	3.7 U	20 J	23	23	13	
GAMMA-CHLORDANE	88 U	88.5 U	89 U	54 J	180 U	260 J	1.9 U	100 J	1.9 U	1.9 U	2 U	
HEPTACHLOR	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	4.8 J	1.9 U	1.9 U	2 U	
HEPTACHLOR EPOXIDE	8.8 U	8.85 U	8.9 U	490 UJ	18 U	340 U	1.9 U	8.8 J	1.9 U	1.9 U	2 U	
TOTAL DDT	0 U	0 U	0 U	758 J	32.5 J	109 J	0 U	46 J	12.1	6.8	4.4	
TOTAL DDT HALFND	27	27	27	758 J	50.5 J	449 J	5.55	47.8 J	13.95	10.5	6.3	
Inorganics (mg/kg)												
ALUMINUM	9790	10295	10800	10800	9380	2110	9660	5670	5070	5070	10700	
ANTIMONY	2.7 U	2.7 U	2.7 U	3.5 J	2.7 U	2.6 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	
ARSENIC	2 J	1.8 J	1.6 J	3.8	2.1 J	0.93 J	2.1 J	1.6 J	2.2 J	2.2 J	2.7	
BARIUM	16.4 J	17.1 J	17.8 J	96	13.1 J	6.2 J	15.3 J	8.6 J	4.6 J	12.8 J	11.7 J	
BERYLLIUM	0.13 J	0.115 J	0.1 J	0.14 J	0.05 UJ	0.05 UJ	0.1 J	0.08 J	0.05 J	0.05 J	0.09 J	
CADMIUM	0.6 U	0.6 U	0.6 U	0.67 U	0.6 U	0.58 U	1 U	0.28 J	1 U	1 U	0.24 J	
CALCIUM	183 J	184.5 J	186 J	1790	375 J	331 J	206 J	332 J	249 J	249 J	483 J	
CHROMIUM	6.9	7.15	7.4	19.6	7.7	2.7	6.7	5	6	7.8	11.8	
COBALT	1.2 J	1.4 J	1.6 J	3.4 J	1.2 J	0.33 UJ	2 J	0.94 J	10 U	10 U	10 U	
COPPER	5.2 J	5.15 J	5.1 J	19.4	5.3 J	8.1	3.7 J	5.5	5 UJ	5 UJ	6.3	
IRON	5810	5835	5860	11700	5500	1500	5630	3480	4310	4310	6690	
LEAD	5.7	5.6	5.5	2230	22.3	8.6	5.2	25.2	40.3	40.3	16.5	19.3 J
MAGNESIUM	108 J	125 J	142 J	1260	99.7 J	65.1 J	137 J	122 J	54.2 J	54.2 J	139 J	
MANGANESE	275	280	285	230	182	31.4	194	46.7	34.2	97.3	122	
MERCURY	0.05 J	0.05 J	0.05 J	0.06 J	0.04 J	0.05 J	0.1 U	0.1 U	0.1 U	0.1 U	0.08	
NICKEL	2.4 U	2.4 U	2.4 U	10	2.3 U	2.3 U	1.6 J	1.8 J	8 U	8 U	2 J	
POTASSIUM	132 U	102.5 J	139 J	166 J	132 U	133 J	115 J	109 J	108 J	62.1 J	90.3 J	
SELENIUM	0.46 U	0.46 U	0.46 U	0.51 U	0.46 U	0.45 U	0.16 J	1 U	1 U	1 U	1 U	
SILVER	1.2 J	0.935 J	0.67 J	1.9 J	0.55 J	0.79 J	2 U	2 U	2 U	2 U	2 U	
SODIUM	177 J	173 J	169 J	307 J	184 J	177 J	183 J	173 J	168 J	168 J	160 J	
VANADIUM	14.9	15.3	15.7	20.3	14.6	4.4 J	14.4	9.3 J	11.9	11.9	17.8	
ZINC	8.8 J	9.35 J	9.9 J	260	47.8	21.5	5.7	23.8	8	8	11.2	
Miscellaneous Parameter (mg/kg)												
CYANIDE	0.24 U	0.24 U	0.24 U	0.27 U	0.24 U	0.24 U	0.09 J	0.19 J	0.13 J	0.09 J	0.09 J	
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS							7	53.1	9.3	8.6	11.6	

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO06	11SO06	11SO07	11SO08	11SO09	11SO10	11SO11	11SO12	11SO13	11SO14	11SO15	11SO16
NSAMPLE	11SO0601-AVG	11SO0601-D	11SO0701	11SO0801	11SO0901	11SO1001	11SO1101	11SO1201	11SO1301	11SO1401	11SO1501	11SO1601
SAMPLE	11SO0601-AVG	11S00601D	11S00701	11S00801	11S00901	11S01001	11S01101	11S01201	11S01301	11SO1401	11SO1501	11SO1601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	1/7/1996	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
ACETONE												
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE												
BIS(2-ETHYLHEXYL)PHTHALATE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-CHLORDANE												
DIELDRIN												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
TOTAL DDT												
TOTAL DDT HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	22.15 J	25	18.7 J	16.5 J	16.8 J	23.3 J	16.2 J	74.8	43.5	104	107	8.8
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
VANADIUM												
ZINC												
Miscellaneous Parameter (mg/kg)												
CYANIDE												
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO17	11SO18	11SO19	11SO20	11SO21	11SO22	11SO22	11SO22	11SO23	11SO24	11SO25	11SO26
NSAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SAMPLE	11SO1701	11SO1801	11SO1901	11SO2001	11SO2101	11SO2201	11SO2201-AVG	11SO2201-D	11SO2301	11SO2401	11SO2501	11SO2601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
ACETONE												
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE												
BIS(2-ETHYLHEXYL)PHTHALATE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-CHLORDANE												
DIELDRIN												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
TOTAL DDT												
TOTAL DDT HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	19.8	23.9	36.2	58.4	29.4	15.4	16.2	17	17.9	41.7	23.2	161
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
VANADIUM												
ZINC												
Miscellaneous Parameter (mg/kg)												
CYANIDE												
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO26	11SO26	11SO27	11SO28	11SO29	11SO30	11SO31	11SO32	11SO33	11SO34	11SO35	11SO36
NSAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SAMPLE	11SO2601-AVG	11SO2601-D	11SO2701	11SO2801	11SO2901	11SO3001	11SO3101	11SO3201	11SO3301	11SO3401	11SO3501	11SO3601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999	4/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
ACETONE												
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE												
BIS(2-ETHYLHEXYL)PHTHALATE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-CHLORDANE												
DIELDRIN												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
TOTAL DDT												
TOTAL DDT HALFND												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	170.5	180	9.3	16.1	68.6	31.2	17.3 J	8.8	7 J	79 J	126 J	8.9 J
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
VANADIUM												
ZINC												
Miscellaneous Parameter (mg/kg)												
CYANIDE												
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS												

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011	0011
LOCATION	11SO37	11SO38	11SO41	11SO42	11SO43	11SO44	11SO44	11SO44	11SO45	11SO48	11SO49	11SO49
NSAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901	11SO4901-AVG
SAMPLE	11SO3701	11SO3801	11SO4101	11SO4201	11SO4301	11SO4401	11SO4401-AVG	11SO4401-D	11SO4501	11SO4801	11SO4901	11SO4901-AVG
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	ORIG	AVG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	4/1/1999	4/1/1999	4/1/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	4/7/1999	6/2/1999	6/2/1999	6/2/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
ACETONE												
Semivolatile Organics (ug/kg)												
BENZO(A)PYRENE										360 U	350 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE										140 U	3.5 U	3.5 U
4,4'-DDT										140 U	3.5 U	3.5 U
ALDRIN												
ALPHA-CHLORDANE										549	21.9	21.35
DIELDRIN										92.3	4.4	4.15
GAMMA-CHLORDANE										678	19.4	18
HEPTACHLOR										139	1.8 U	1.8 U
HEPTACHLOR EPOXIDE										62.6 J	1.1 J	1.25 J
TOTAL DDT										0 U	0 U	0 U
TOTAL DDT HALFND										140	3.5	3.5
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC												
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD	6.9 J	666 J	13.6	5.2	7.5	9.9	10.15	10.4	10.9			
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
VANADIUM												
ZINC												
Miscellaneous Parameter (mg/kg)												
CYANIDE												
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS											8.8 J	8.8 J

APPENDIX TABLE A-3-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011	0011	0011	0011
LOCATION	11SO49	11SO50	11SO51	11SS47	11SS47	11SS47
NSAMPLE	11SO4901-D	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SAMPLE	11SO5301	11SO5001	11SO5101	11SS4701	11SS4702	11SS4703
SUBMATRIX	SS	SS	SS	SS	SS	SS
SACODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	2 - 2	2 - 2	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	6/2/1999	6/2/1999	6/2/1999	6/2/1999	9/1/1999	9/1/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)						
ACETONE						
Semivolatile Organics (ug/kg)						
BENZO(A)PYRENE	350 U	350 U	3600 U	3600 U	10 U	43
BIS(2-ETHYLHEXYL)PHTHALATE						
Pesticides PCBs (ug/kg)						
4,4'-DDD						
4,4'-DDE	3.5 U	3.5 U	36 U	73 U		
4,4'-DDT	3.5 U	3.5 U	36 U	36.5 J		
ALDRIN						
ALPHA-CHLORDANE	20.8	24.7	198	216		
DIELDRIN	3.9	3.5	25.3	136		
GAMMA-CHLORDANE	16.6	21	170	184		
HEPTACHLOR	1.8 U	1.8 U	18 U	36 U		
HEPTACHLOR EPOXIDE	1.4 J	1.8 U	18.6	19.9 J		
TOTAL DDT	0 U	0 U	0 U	36.5 J		
TOTAL DDT HALFND	3.5	3.5	36	73 J		
Inorganics (mg/kg)						
ALUMINUM						
ANTIMONY						
ARSENIC						
BARIUM						
BERYLLIUM						
CADMIUM						
CALCIUM						
CHROMIUM						
COBALT						
COPPER						
IRON						
LEAD						
MAGNESIUM						
MANGANESE						
MERCURY						
NICKEL						
POTASSIUM						
SELENIUM						
SILVER						
SODIUM						
VANADIUM						
ZINC						
Miscellaneous Parameter (mg/kg)						
CYANIDE						
Petroleum Hydrocarbon (mg/kg)						
TOTAL PETROLEUM HYDROCARBONS				302 J		

APPENDIX TABLE A-3-5
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0011	0011	0011
LOCATION	TP-11-01	TP-11-02	TP-11-03
NSAMPLE	11SS0101	11SS0202	11SS0303
SAMPLE	11SS0101	11SS0202	11SS0303
SUBMATRIX	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 6	5 - 6	5 - 6
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)			
TOLUENE	4 J	11 U	12 U
TOTAL XYLENES	4 J	4 J	8 J
Semivolatile Organics (ug/kg)			
BIS(2-ETHYLHEXYL)PHTHALATE	100 J	370 U	4000 U
ACETONE	100 J	19 UJ	80 J
Pesticides PCBs (ug/kg)			
4,4'-DDD	22 J	3.7 U	120
4,4'-DDE	5 J	27	22 J
4,4'-DDT	7.6 U	8.4	28 J
ALDRIN	7 J	1.9 U	21 U
AROCLOR-1254	260 J	37 U	400 U
AROCLOR-1260	62 J	37 U	400 U
DIELDRIN	23 J	2 J	33 J
Inorganics (mg/kg)			
ALUMINUM	17100	19400	11300
ARSENIC	3.9	5.5	3.7
BARIUM	14.6 J	10.7 J	28.5 J
BERYLLIUM	0.18 J	0.21 J	0.12 J
CADMIUM	5	0.67 U	6.5
CALCIUM	601 J	766 J	12100
CHROMIUM	19.5	17.2	11.4
COBALT	1.2 J	1.1 J	1.7 J
COPPER	17.2	5.9	6.7
IRON	16800	15600	7780
LEAD	64.4	7.4	109
MAGNESIUM	85.2 J	97 J	311 J
MANGANESE	20.6	41	188
MERCURY	0.11	0.08 J	0.2 J
NICKEL	3.7 J	3.5 J	3.9 J
SELENIUM	0.48 U	0.56 J	0.5 U
SODIUM	176 J	167 J	189 J
VANADIUM	34.9	37.5	22.2
ZINC	298	12.8 J	100

APPENDIX TABLE A-3-6
SUMMARY OF CHEMICALS DETECTED - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0011**
LOCATION	**11-SL-04**
NSAMPLE	**11-SL-04**
SAMPLE	**11-SL-04**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**8/18/1992**
COLLECTION METHOD	**GRAB**
Semivolatile Organics (ug/kg)	
2-METHYLNAPHTHALENE	49 J
ACENAPHTHYLENE	110 J
ANTHRACENE	280 J
BENZO(A)ANTHRACENE	1800
BENZO(A)PYRENE	910
BENZO(B)FLUORANTHENE	710
BENZO(G,H,I)PERYLENE	310 J
BENZO(K)FLUORANTHENE	870
BIS(2-ETHYLHEXYL)PHTHALATE	540
CHRYSENE	2500
FLUORANTHENE	1300
INDENO(1,2,3-CD)PYRENE	230 J
PHENANTHRENE	2100
PYRENE	3400
Pesticides PCBs (ug/kg)	
4,4'-DDE	4.9 J
4,4'-DDT	6.7 J
ALPHA-CHLORDANE	39 J
DIELDRIN	4.9 J
GAMMA-CHLORDANE	29 J
Inorganics (mg/kg)	
ALUMINUM	6100
ARSENIC	1.5 J
BARIUM	6.3 J
CALCIUM	248 J
CHROMIUM	4.5
COBALT	0.35 J
COPPER	4 J
IRON	3540
LEAD	7.8
MAGNESIUM	82.7 J
MANGANESE	39.4
MERCURY	0.04 J
SILVER	0.93 J
SODIUM	189 J
VANADIUM	9.5 J
ZINC	9.4 J

APPENDIX TABLE A-3-7
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
ACETONE	1/9	100 J	100 J	11 - 12	16.1	100	11-SL-02
Semivolatile Organics (ug/kg)							
BENZO(A)PYRENE	1/16	43	43	10 - 4000	478	43.0	11SS4703
BIS(2-ETHYLHEXYL)PHTHALATE	4/9	52 J	130 J	350 - 4000	340	83.5	11SO0201
Pesticides PCBs (ug/kg)							
4,4'-DDD	1/9	140 J	140 J	3.6 - 680	57.4	140	11-SL-02
4,4'-DDE	6/14	2.1	88 J	3.5 - 140	23.0	30.2	11-SL-02
4,4'-DDT	8/14	2.3	530 J	3.5 - 140	56.2	85.6	11-SL-02
ALDRIN	1/9	0.96 J	0.96 J	1.9 - 490	48.1	0.960	11SO0201
ALPHA-CHLORDANE	8/14	20.8	549	1.9 - 180	119	191	11SO4801
DIELDRIN	12/14	3.5	210 J	3.7 - 18	43.6	49.9	11-SL-02
GAMMA-CHLORDANE	8/14	16.6	678	1.9 - 180	116	186	11SO4801
HEPTACHLOR	2/14	4.8 J	139	1.8 - 490	43.2	71.9	11SO4801
HEPTACHLOR EPOXIDE	5/14	1.1 J	62.6 J	1.8 - 490	38.9	22.2	11SO4801
Inorganics (mg/kg)							
ALUMINUM	9/9	2110	10800	---	7639	7639	11-SL-01-D, 11-SL-02
ANTIMONY	1/9	3.5 J	3.5 J	2.6 - 12	4.17	3.50	11-SL-02
ARSENIC	9/9	0.93 J	3.8	---	2.16	2.16	11-SL-02
BARIUM	9/9	4.6 J	96	---	20.6	20.6	11-SL-02
BERYLLIUM	7/9	0.05 J	0.14 J	0.05	0.0750	0.0893	11-SL-02
CADMIUM	2/9	0.24 J	0.28 J	0.58 - 1	0.361	0.260	11SO0201
CALCIUM	9/9	183 J	1790	---	467	467	11-SL-02
CHROMIUM	9/9	2.7	19.6	---	8.27	8.27	11-SL-02
COBALT	5/9	0.94 J	3.4 J	0.33 - 10	2.68	1.79	11-SL-02
COPPER	7/9	3.7 J	19.4	5	6.49	7.64	11-SL-02
IRON	9/9	1500	11700	---	5439	5439	11-SL-02
LEAD	47/47	5.2	2230	---	93.1	93.1	11-SL-02
MAGNESIUM	9/9	54.2 J	1260	---	228	228	11-SL-02
MANGANESE	9/9	31.4	285	---	135	135	11-SL-01-D
MERCURY	5/9	0.04 J	0.08	0.1	0.0533	0.0560	11SO0501
NICKEL	4/9	1.6 J	10	2.3 - 8	2.99	3.85	11-SL-02
POTASSIUM	8/9	62.1 J	166 J	132	106	111	11-SL-02
SELENIUM	1/9	0.16 J	0.16 J	0.45 - 1	0.344	0.160	11SO0101
SILVER	4/9	0.55 J	1.9 J	2	1.02	1.04	11-SL-02
SODIUM	9/9	160 J	307 J	---	188	188	11-SL-02
VANADIUM	9/9	4.4 J	20.3	---	13.3	13.3	11-SL-02
ZINC	9/9	5.7	260	---	43.9	43.9	11-SL-02
Miscellaneous Parameter (mg/kg)							
CYANIDE	5/9	0.09 J	0.19 J	0.24 - 0.27	0.121	0.118	11SO0201
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	7/7	7	302 J	---	57.2	57.2	11SS4701

APPENDIX TABLE A-3-8
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
ACETONE	2/3	80 J	100 J	19	63.2	90.0	11SS0101
TOLUENE	1/3	4 J	4 J	11 - 12	5.17	4.00	11SS0101
TOTAL XYLENES	3/3	4 J	8 J	---	5.33	5.33	11SS0303
Semivolatile Organics (ug/kg)							
BIS(2-ETHYLHEXYL)PHTHALATE	1/3	100 J	100 J	370 - 4000	762	100	11SS0101
Pesticides PCBs (ug/kg)							
4,4'-DDD	2/3	22 J	120	3.7	48.0	71.0	11SS0303
4,4'-DDE	3/3	5 J	27	---	18.0	18.0	11SS0202
4,4'-DDT	2/3	8.4	28 J	7.6	13.4	18.2	11SS0303
ALDRIN	1/3	7 J	7 J	1.9 - 21	6.15	7.00	11SS0101
AROCLOR-1254	1/3	260 J	260 J	37 - 400	160	260	11SS0101
AROCLOR-1260	1/3	62 J	62 J	37 - 400	93.5	62.0	11SS0101
DIELDRIN	3/3	2 J	33 J	---	19.3	19.3	11SS0303
Inorganics (mg/kg)							
ALUMINUM	3/3	11300	19400	---	15933	15933	11SS0202
ARSENIC	3/3	3.7	5.5	---	4.37	4.37	11SS0202
BARIUM	3/3	10.7 J	28.5 J	---	17.9	17.9	11SS0303
BERYLLIUM	3/3	0.12 J	0.21 J	---	0.170	0.170	11SS0202
CADMIUM	2/3	5	6.5	0.67	3.95	5.75	11SS0303
CALCIUM	3/3	601 J	12100	---	4489	4489	11SS0303
CHROMIUM	3/3	11.4	19.5	---	16.0	16.0	11SS0101
COBALT	3/3	1.1 J	1.7 J	---	1.33	1.33	11SS0303
COPPER	3/3	5.9	17.2	---	9.93	9.93	11SS0101
IRON	3/3	7780	16800	---	13393	13393	11SS0101
LEAD	3/3	7.4	109	---	60.3	60.3	11SS0303
MAGNESIUM	3/3	85.2 J	311 J	---	164	164	11SS0303
MANGANESE	3/3	20.6	188	---	83.2	83.2	11SS0303
MERCURY	3/3	0.08 J	0.2 J	---	0.130	0.130	11SS0303
NICKEL	3/3	3.5 J	3.9 J	---	3.70	3.70	11SS0303
SELENIUM	1/3	0.56 J	0.56 J	0.48 - 0.5	0.350	0.560	11SS0202
SODIUM	3/3	167 J	189 J	---	177	177	11SS0303
VANADIUM	3/3	22.2	37.5	---	31.5	31.5	11SS0202
ZINC	3/3	12.8 J	298	---	137	137	11SS0101

APPENDIX TABLE A-3-9
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

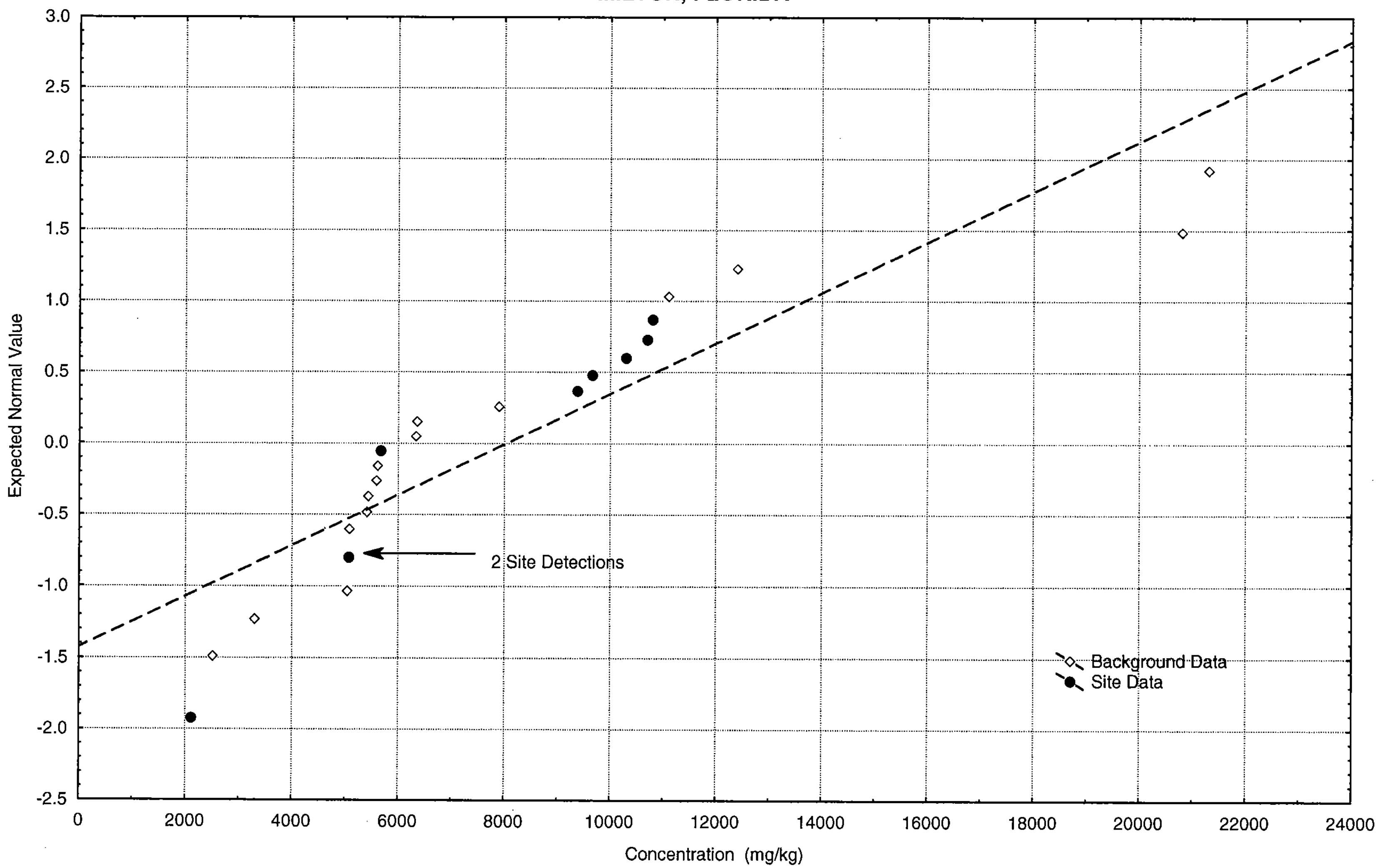
Chemical	Normal Statistics											Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Minimum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detects	Median	Standard Deviation	Coefficient of Variation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)															
ACETONE	**9**	**1**	**11%**	**100**	**100**	**16.1**	**100**	**5.50**	**31.5**	**1.96**	**3.00**	**Shapiro-Wilk**	**Undefined**	**32.4**	**Non-Parametric UCL**
Semivolatile Organics (ug/kg)															
BENZO(A)PYRE	**16**	**1**	**6%**	**43.0**	**43.0**	**478**	**43.0**	**184**	**692**	**1.45**	**1.76**	**Shapiro-Wilk**	**Undefined**	**43.0**	**Maximum Detected Concentration**
BIS(2-ETHYLHE	**9**	**4**	**44%**	**52.0**	**130**	**340**	**83.5**	**175**	**625**	**1.84**	**2.96**	**Shapiro-Wilk**	**Undefined**	**130**	**Maximum Detected Concentration**
Pesticides PCBs (ug/kg)															
4,4'-DDD	**9**	**1**	**11%**	**140**	**140**	**57.4**	**140**	**1.90**	**115**	**2.01**	**2.33**	**Shapiro-Wilk**	**Undefined**	**117**	**Non-Parametric UCL**
4,4'-DDE	**14**	**6**	**43%**	**2.10**	**88.0**	**23.0**	**30.2**	**7.15**	**29.7**	**1.29**	**1.32**	**Shapiro-Wilk**	**Undefined**	**35.6**	**Non-Parametric UCL**
4,4'-DDT	**14**	**8**	**57%**	**2.30**	**530**	**56.2**	**85.6**	**13.5**	**138**	**2.45**	**3.61**	**Shapiro-Wilk**	**Lognormal**	**265**	**99% Chebyshev(MVUE) UCL**
ALDRIN	**9**	**1**	**11%**	**0.960**	**0.960**	**48.1**	**0.960**	**1.00**	**92.3**	**1.92**	**1.79**	**Shapiro-Wilk**	**Undefined**	**0.960**	**Maximum Detected Concentration**
ALPHA-CHLOR	**14**	**8**	**57%**	**21.4**	**549**	**119**	**191**	**53.1**	**157**	**1.32**	**1.81**	**Shapiro-Wilk**	**Undefined**	**184**	**Non-Parametric UCL**
DIELDRIN	14	12	86%	3.50	210	43.6	49.9	21.5	61.3	1.41	2.01	Shapiro-Wilk	Lognormal	126	95% Chebyshev(MVUE) UCL
GAMMA-CHLO	**14**	**8**	**57%**	**18.0**	**678**	**116**	**186**	**49.1**	**181**	**1.56**	**2.61**	**Shapiro-Wilk**	**Undefined**	**191**	**Non-Parametric UCL**
HEPTACHLOR	**14**	**2**	**14%**	**4.80**	**139**	**43.2**	**71.9**	**4.61**	**79.7**	**1.85**	**1.85**	**Shapiro-Wilk**	**Undefined**	**78.5**	**Non-Parametric UCL**
HEPTACHLOR	**14**	**5**	**36%**	**1.25**	**62.6**	**38.9**	**22.2**	**6.61**	**74.7**	**1.92**	**2.28**	**Shapiro-Wilk**	**Undefined**	**62.6**	**Maximum Detected Concentration**
Inorganics (mg/kg)															
ALUMINUM	9	9	100%	2110	10800	7639	7639	9380	3185	0.417	-0.587	Shapiro-Wilk	Normal	9614	Student-t
ANTIMONY	**9**	**1**	**11%**	**3.50**	**3.50**	**4.17**	**3.50**	**6.00**	**2.27**	**0.546**	**-0.516**	**Shapiro-Wilk**	**Undefined**	**3.50**	**Maximum Detected Concentration**
ARSENIC	9	9	100%	0.930	3.80	2.16	2.16	2.10	0.786	0.364	0.827	Shapiro-Wilk	Normal/Lognormal	2.65	Student-t
BARIUM	9	9	100%	4.60	96.0	20.6	20.6	12.8	28.6	1.39	2.88	Shapiro-Wilk	Lognormal	47.2	H-UCL
BERYLLIUM	9	7	78%	0.050	0.140	0.075	0.089	0.080	0.040	0.536	0.189	Shapiro-Wilk	Normal/Lognormal	0.138	H-UCL
CADMIUM	**9**	**2**	**22%**	**0.240**	**0.280**	**0.361**	**0.260**	**0.300**	**0.107**	**0.298**	**0.654**	**Shapiro-Wilk**	**Undefined**	**0.280**	**Maximum Detected Concentration**
CALCIUM	9	9	100%	185	1790	467	467	331	505	1.08	2.81	Shapiro-Wilk	Undefined	736	Non-Parametric UCL
CHROMIUM	9	9	100%	2.70	19.6	8.27	8.27	7.15	4.90	0.592	1.74	Shapiro-Wilk	Lognormal	13.3	H-UCL
COBALT	**9**	**5**	**56%**	**0.940**	**3.40**	**2.68**	**1.79**	**2.00**	**1.95**	**0.727**	**0.243**	**Shapiro-Wilk**	**Normal/Lognormal**	**3.40**	**Maximum Detected Concentration**
COPPER	9	7	78%	3.70	19.4	6.49	7.64	5.30	5.16	0.795	2.34	Shapiro-Wilk	Lognormal	11.3	H-UCL
IRON	9	9	100%	1500	11700	5439	5439	5500	2803	0.515	1.28	Shapiro-Wilk	Normal/Lognormal	8959	H-UCL
LEAD	47	47	100%	5.20	2230	93.1	93.1	19.8	333	3.58	6.08	Shapiro-Wilk	Undefined	172	Non-Parametric UCL
MAGNESIUM	9	9	100%	54.2	1260	228	228	122	388	1.70	2.95	Shapiro-Wilk	Undefined	445	Non-Parametric UCL
MANGANESE	9	9	100%	31.4	280	135	135	122	90.8	0.671	0.274	Shapiro-Wilk	Normal/Lognormal	280	Maximum Detected Concentration
MERCURY	**9**	**5**	**56%**	**0.040**	**0.080**	**0.053**	**0.056**	**0.050**	**0.011**	**0.210**	**1.92**	**Shapiro-Wilk**	**Undefined**	**0.059**	**Non-Parametric UCL**
NICKEL	**9**	**4**	**44%**	**1.60**	**10.0**	**2.99**	**3.85**	**1.80**	**2.86**	**0.957**	**2.22**	**Shapiro-Wilk**	**Lognormal**	**6.03**	**H-UCL**
POTASSIUM	9	8	89%	62.1	166	106	111	108	32.0	0.303	0.439	Shapiro-Wilk	Normal/Lognormal	126	Student-t
SELENIUM	**9**	**1**	**11%**	**0.160**	**0.160**	**0.344**	**0.160**	**0.255**	**0.150**	**0.435**	**0.161**	**Shapiro-Wilk**	**Undefined**	**0.160**	**Maximum Detected Concentration**
SILVER	**9**	**4**	**44%**	**0.550**	**1.90**	**1.02**	**1.04**	**1.00**	**0.364**	**0.357**	**1.89**	**Shapiro-Wilk**	**Undefined**	**1.21**	**Non-Parametric UCL**
SODIUM	9	9	100%	160	307	188	188	173	45.2	0.240	2.84	Shapiro-Wilk	Undefined	211	Non-Parametric UCL
VANADIUM	9	9	100%	4.40	20.3	13.3	13.3	14.4	4.68	0.351	-0.534	Shapiro-Wilk	Normal/Lognormal	16.2	Student-t
ZINC	9	9	100%	5.70	260	43.9	43.9	11.2	82.1	1.87	2.86	Shapiro-Wilk	Lognormal	94.4	95% Chebyshev(MVUE) UCL
Miscellaneous Parameter (mg/kg)															
CYANIDE	9	5	56%	0.090	0.190	0.121	0.118	0.120	0.031	0.261	1.31	Shapiro-Wilk	Normal/Lognormal	0.140	Student-t
Petroleum Hydrocarbon (mg/kg)															
TOTAL PETROL	7	7	100%	7.00	302	57.2	57.2	9.30	109	1.91	2.53	Shapiro-Wilk	Undefined	120	Non-Parametric UCL

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

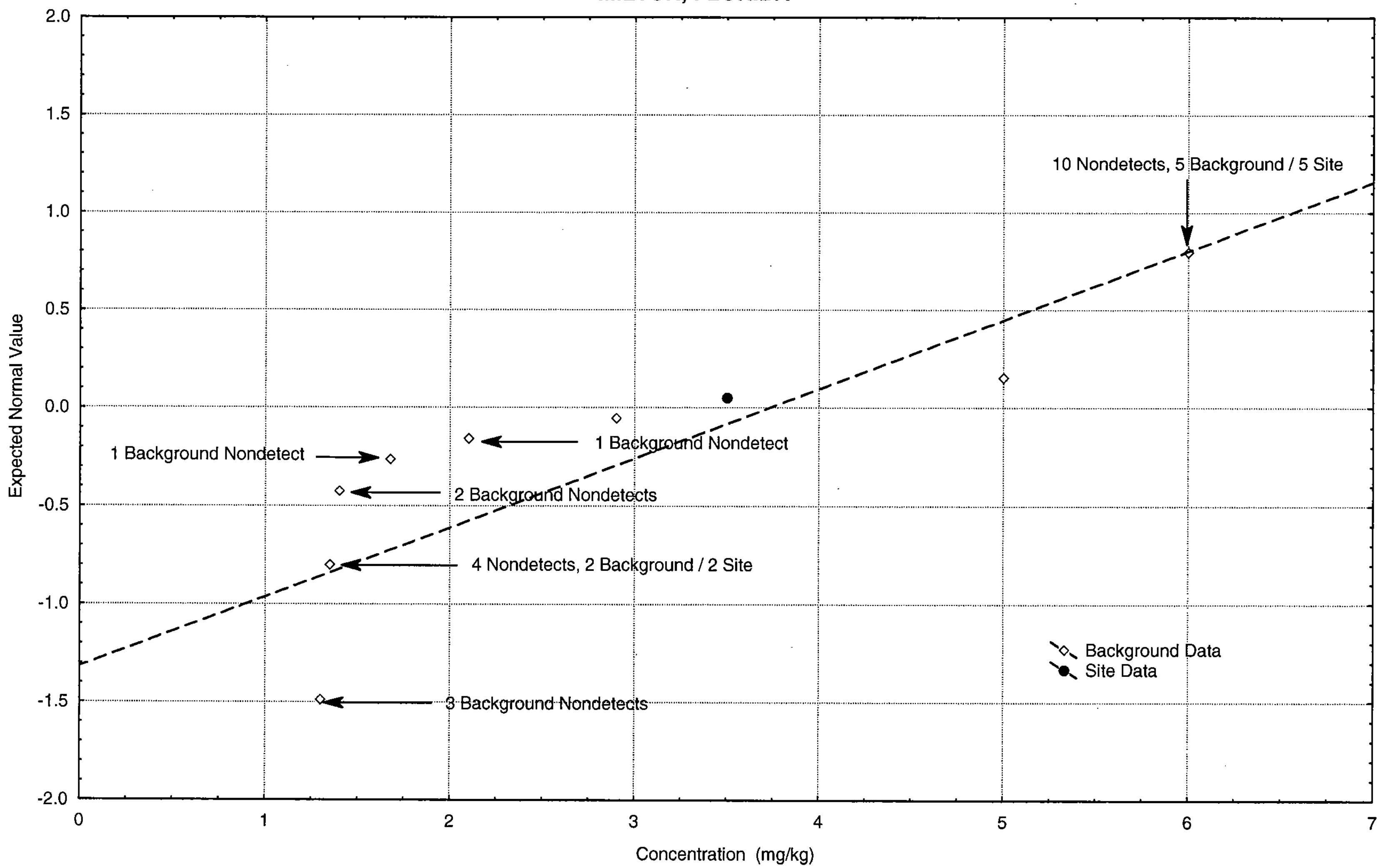
APPENDIX TABLE A-3-10
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUAMN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 11 SURFACE SOIL																			
BARIUM	9/9	15/15	24/24	0%	PASS	96	33.9 J	20.6	12.7	LOGNORMAL	LOGNORMAL	PASS	---	WRS	0.805	0.421	NO	PASS	NO
CHROMIUM	9/9	15/15	24/24	0%	PASS	19.6	16.3	8.27	6.12	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	2.15	0.157	NO	PASS	NO
COPPER	7/9	12/15	19/24	21%	PASS	19.4	8.5	6.49	3.97	LOGNORMAL	LOGNORMAL	PASS	---	WRS	1.50	0.134	NO	PASS	NO
COBALT	5/9	12/15	17/24	29%	PASS	3.4 J	2.9 J	2.68	1.48	NORMAL	LOGNORMAL	**FAIL**	---	WRS	1.65	0.0999	**YES**	---	**YES**
IRON	9/9	15/15	24/24	0%	PASS	11700	12500	5439	4802	LOGNORMAL	UNDEFINED	**FAIL**	---	WRS	1.22	0.221	NO	PASS	NO
LEAD	47/47	15/15	62/62	0%	PASS	2230	9.8 J	93.1	5.49	UNDEFINED	NORMAL	**FAIL**	---	WRS	5.14	0.00	**YES**	---	**YES**
NICKEL	4/9	6/15	10/24	58%	**FAIL**	10	5.9 J	2.99	2.65	---	---	---	---	Proportions	-0.159	0.437	NO	PASS	NO
VANADIUM	9/9	15/15	24/24	0%	PASS	20.3	31.9	13.3	12.0	NORMAL	UNDEFINED	**FAIL**	---	WRS	1.40	0.161	NO	PASS	NO

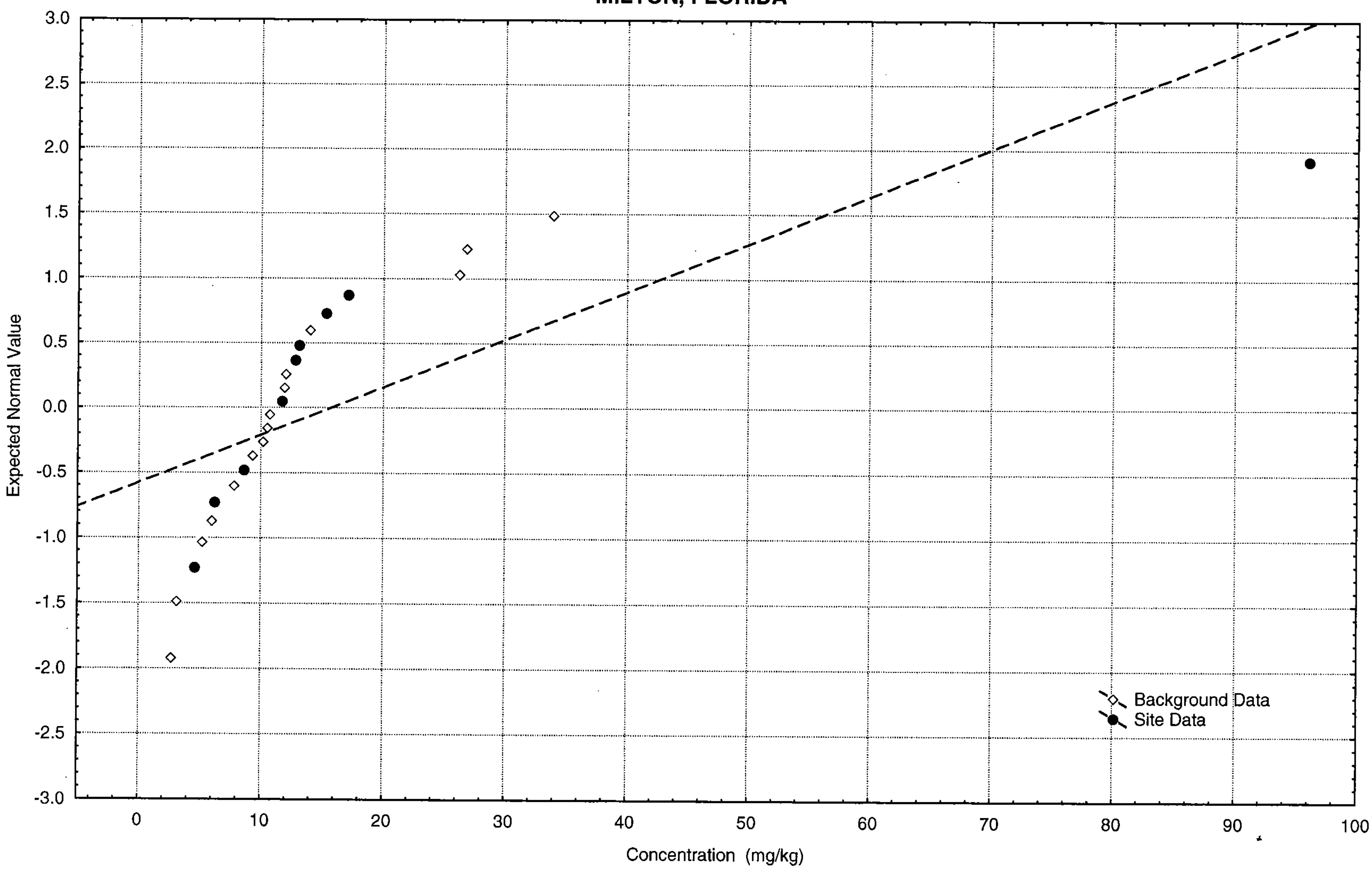
APPENDIX FIGURE A-3-1
NORMAL PROBABILITY PLOT - ALUMINUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



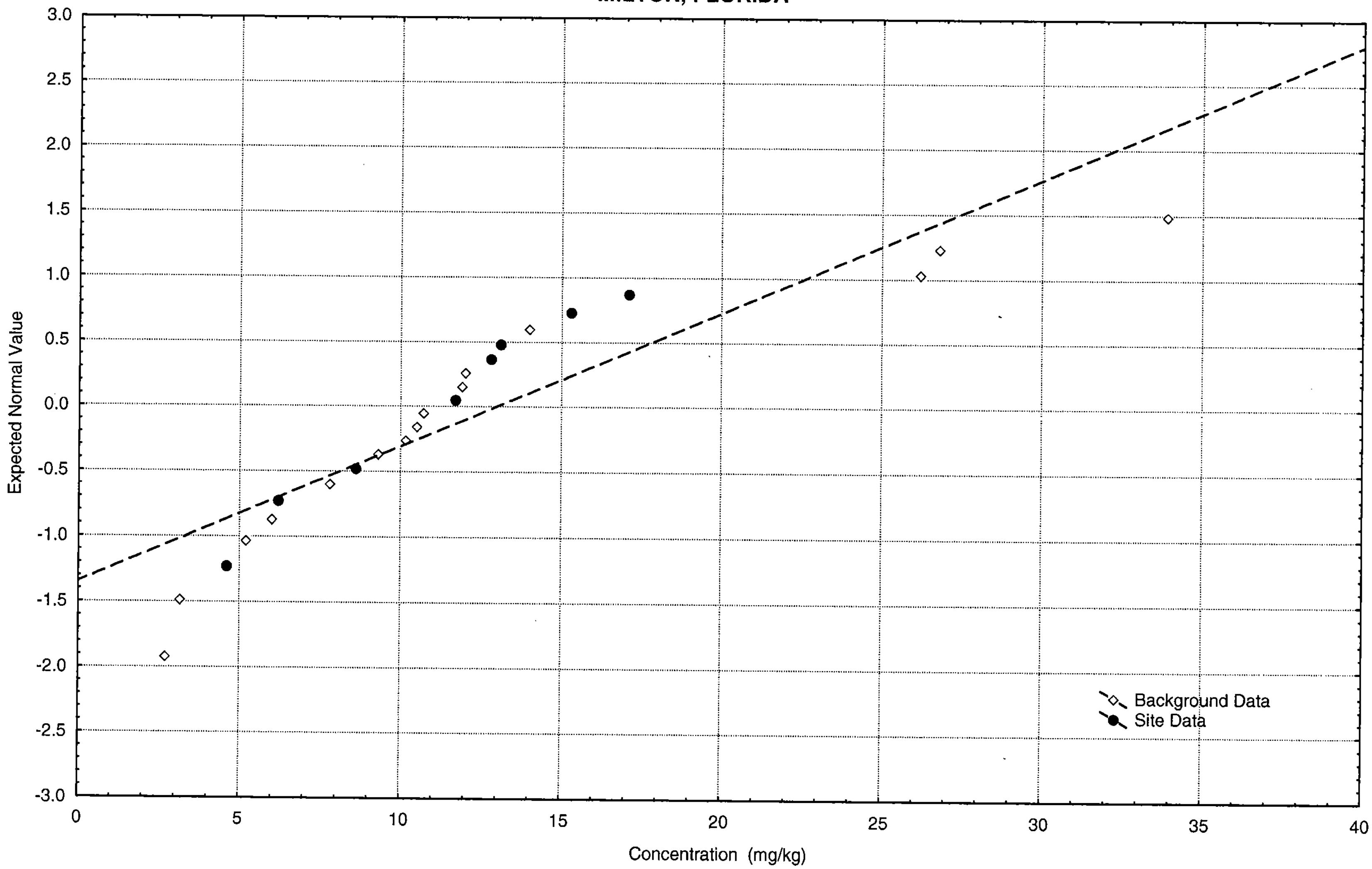
APPENDIX FIGURE A-3-2
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



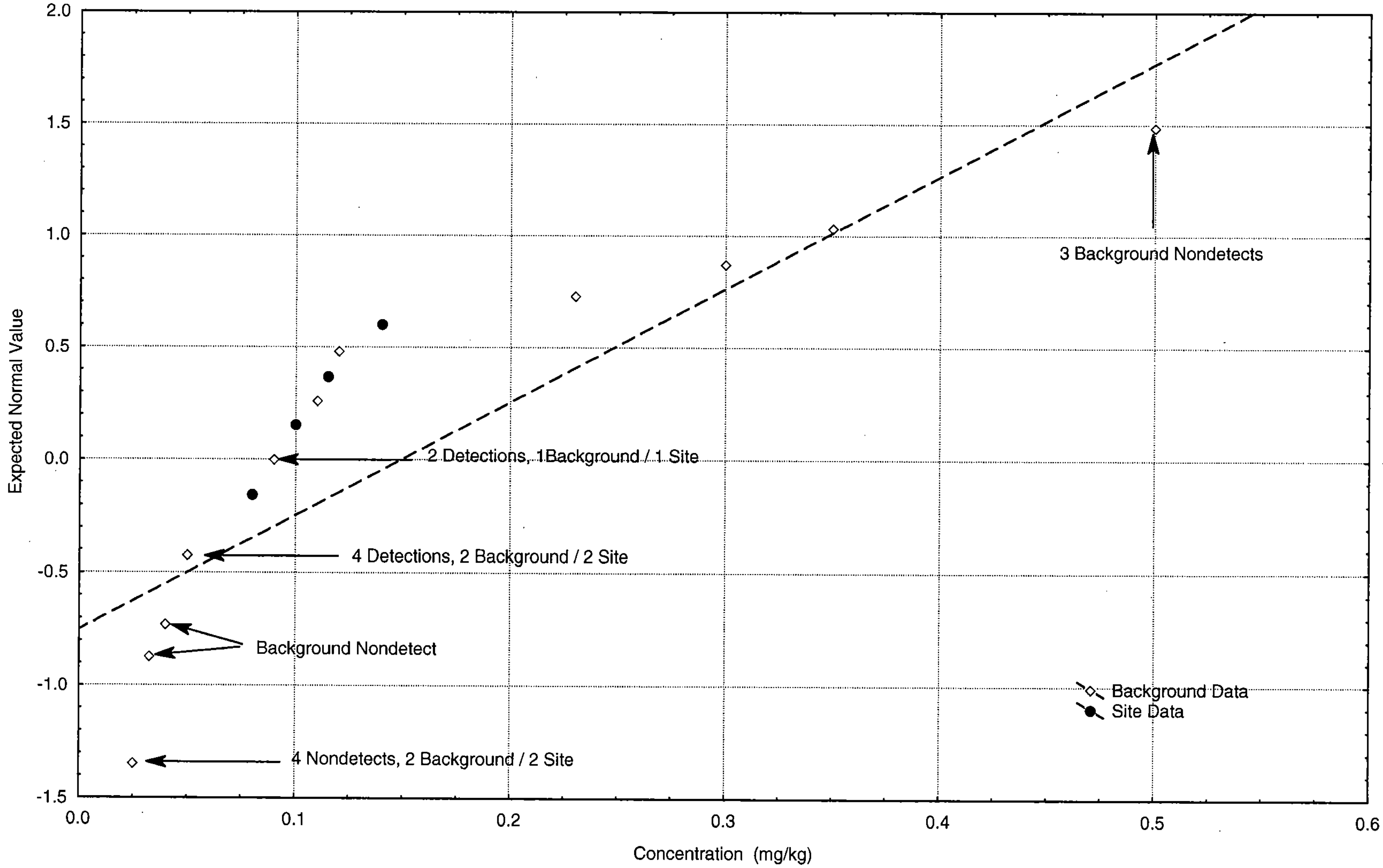
APPENDIX FIGURE A-3-3
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



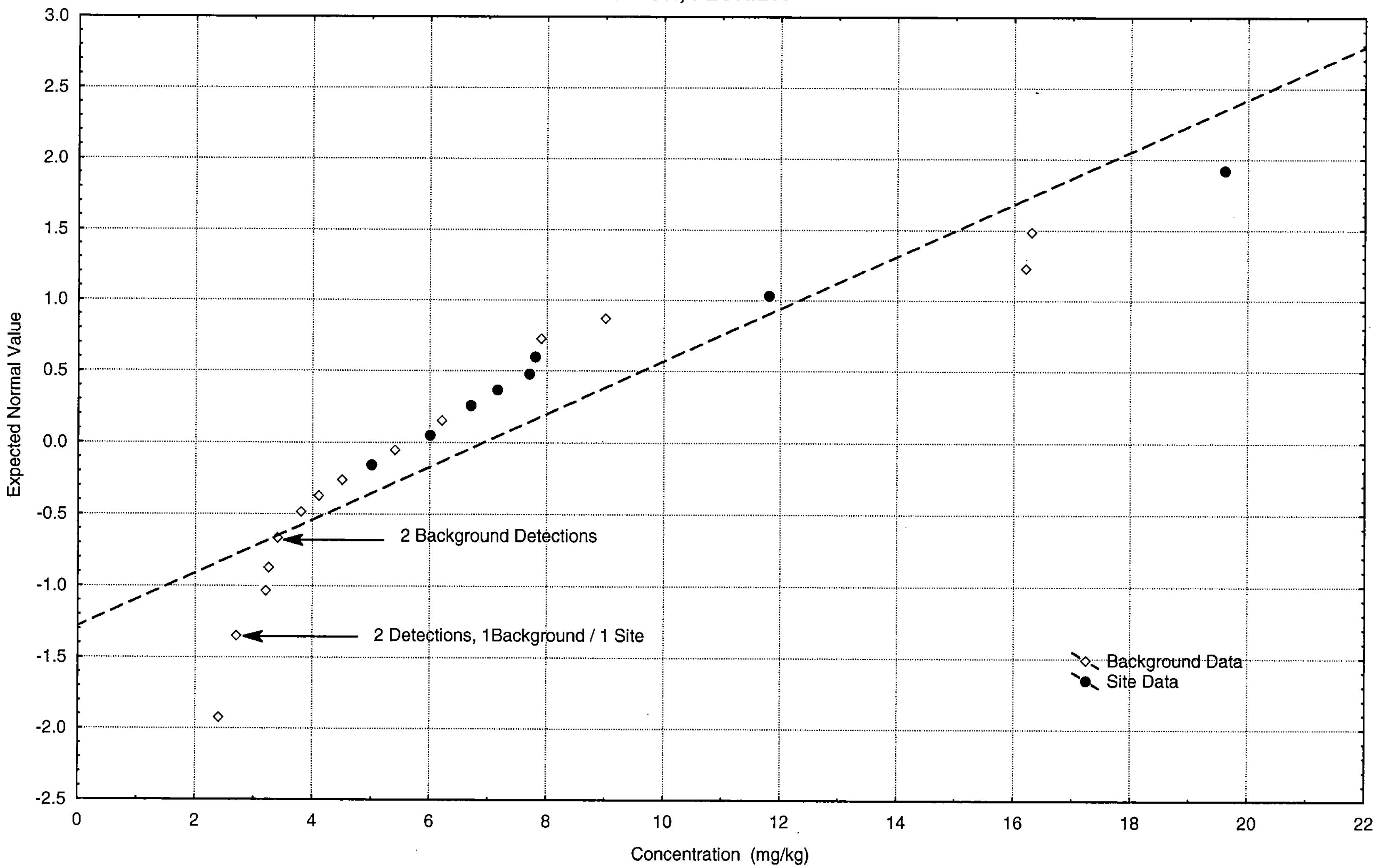
APPENDIX FIGURE A-3-4
NORMAL PROBABILITY PLOT - BARIUM (excluding 11-SL-02) - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



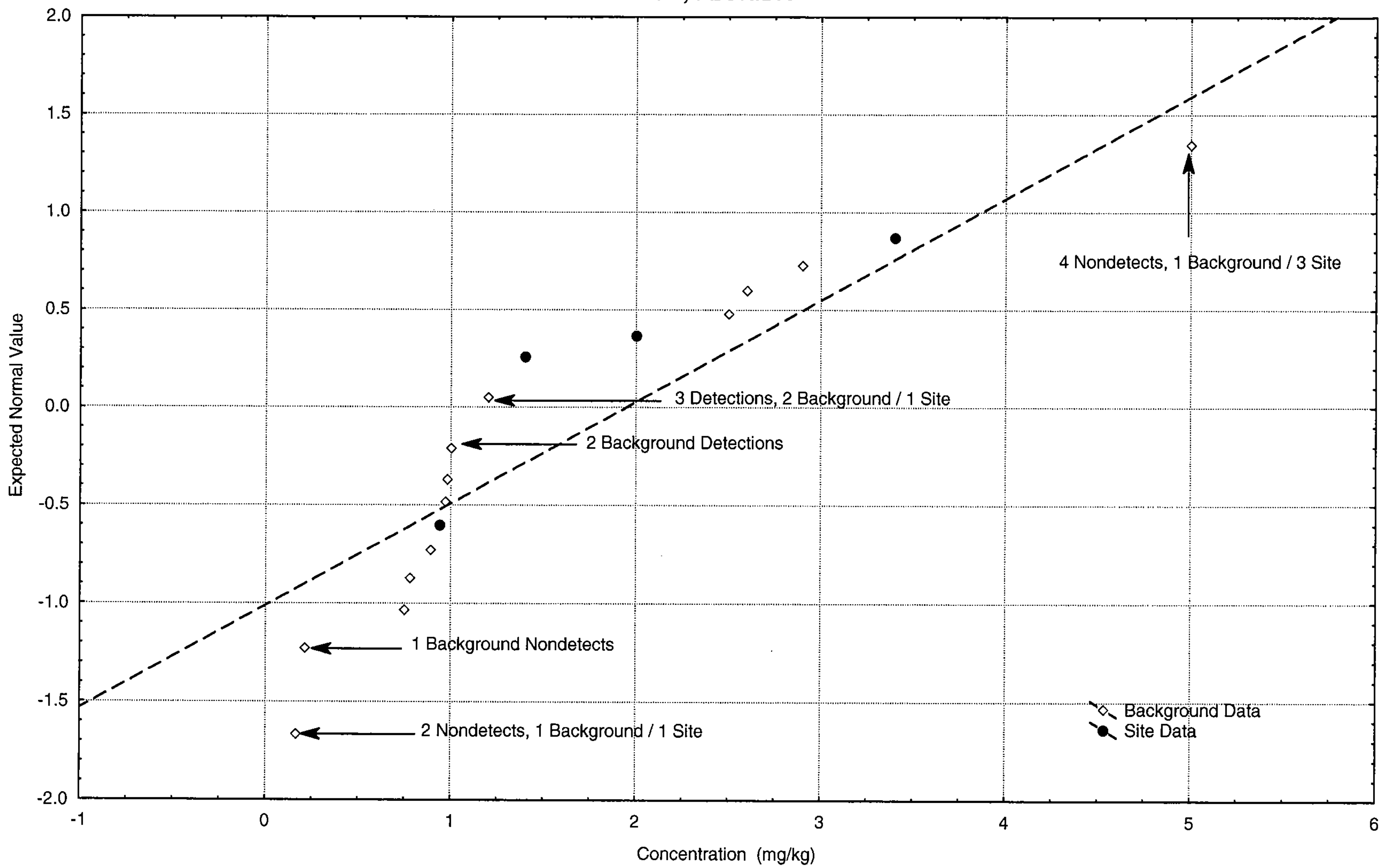
APPENDIX FIGURE A-3-5
NORMAL PROBABILITY PLOT - BERYLLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



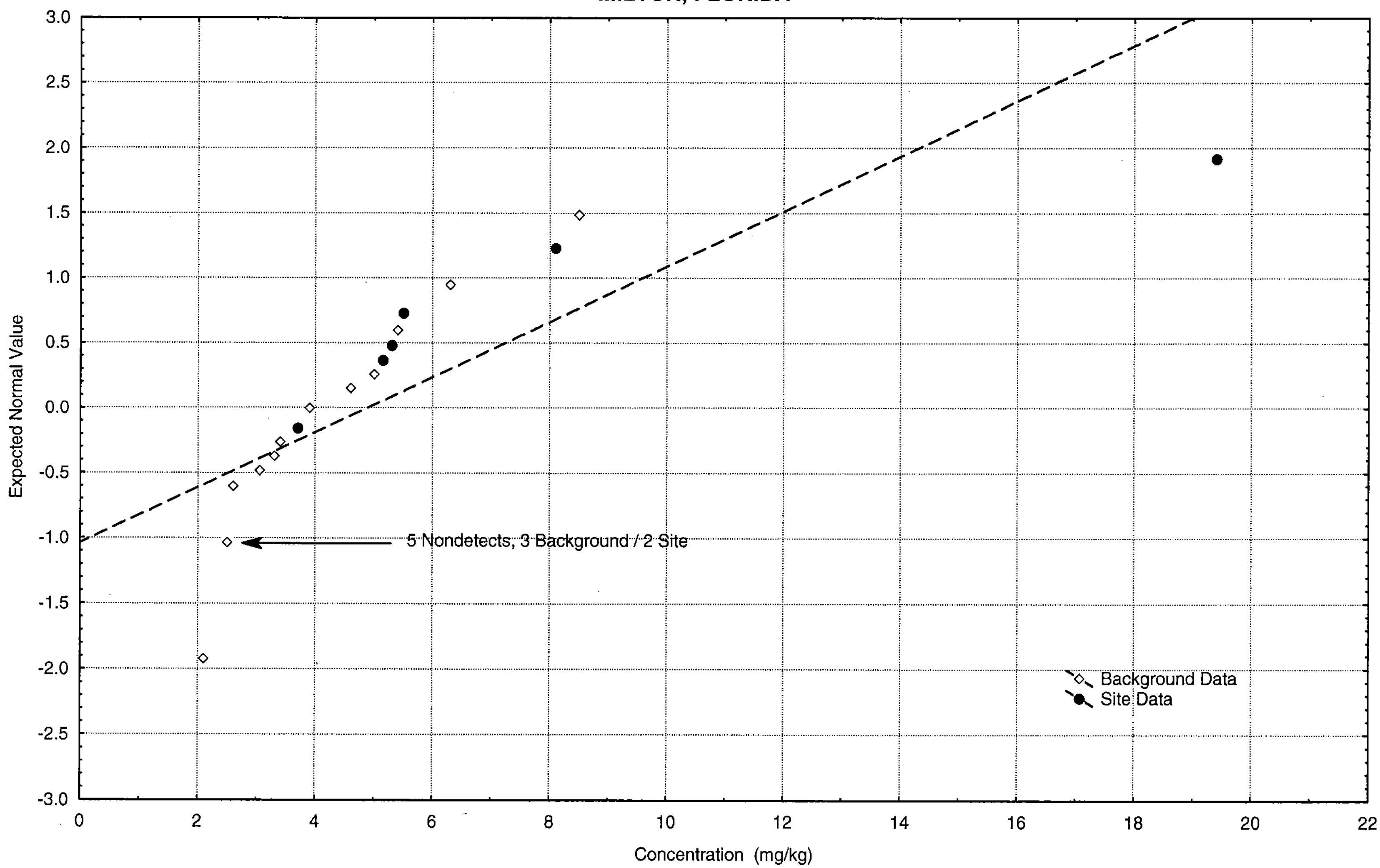
APPENDIX FIGURE A-3-6
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



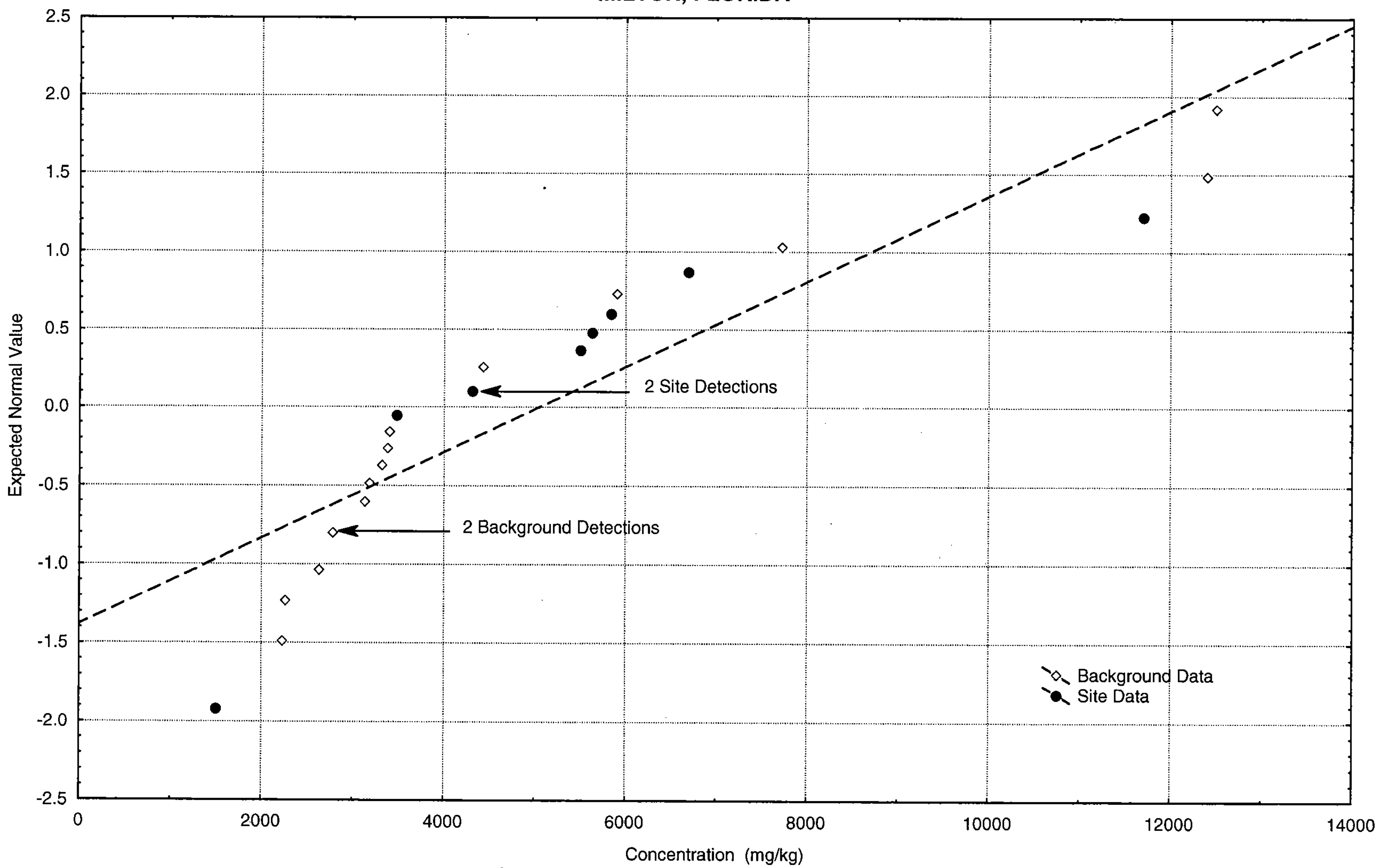
APPENDIX FIGURE A-3-7
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



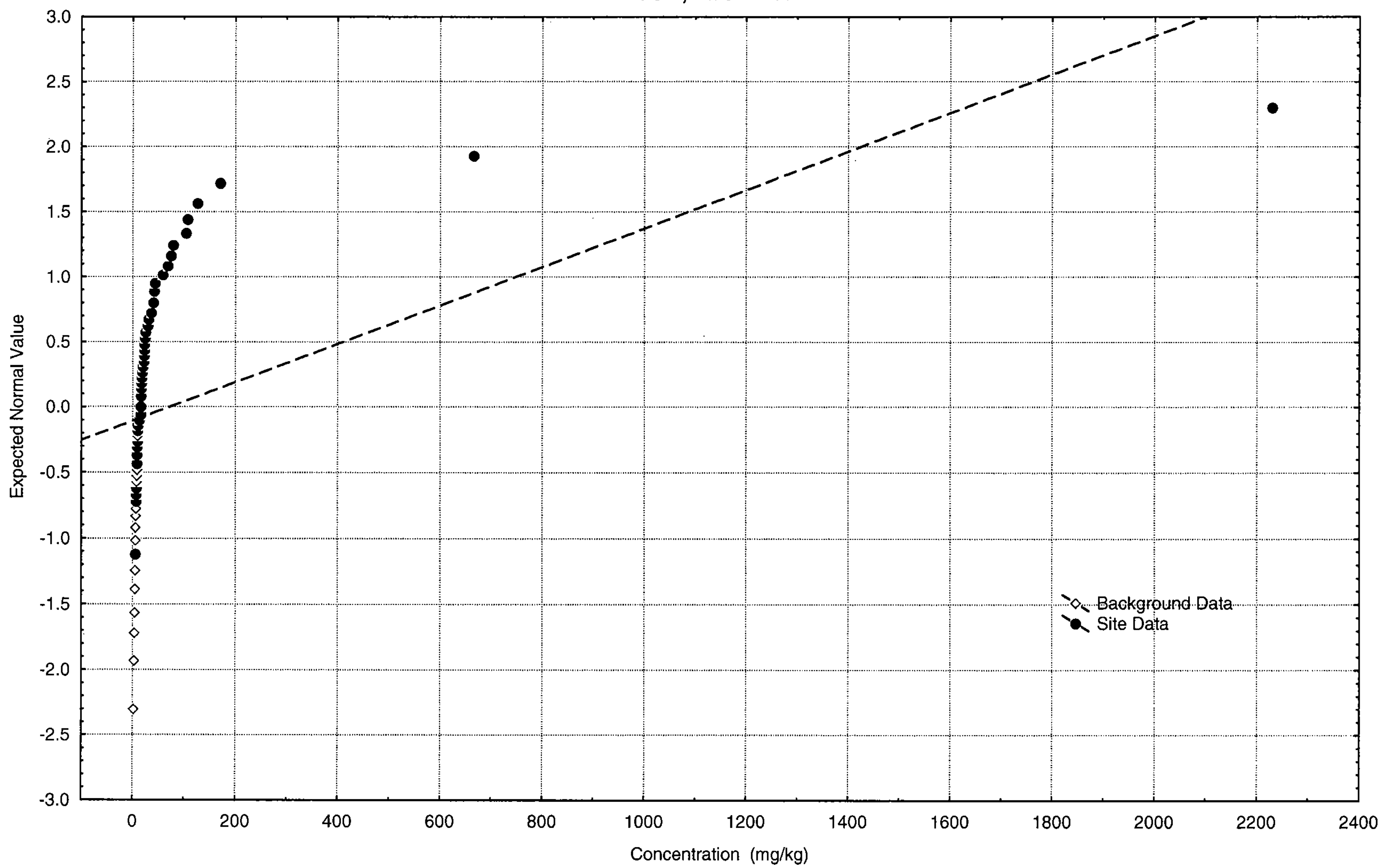
APPENDIX FIGURE A-3-8
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



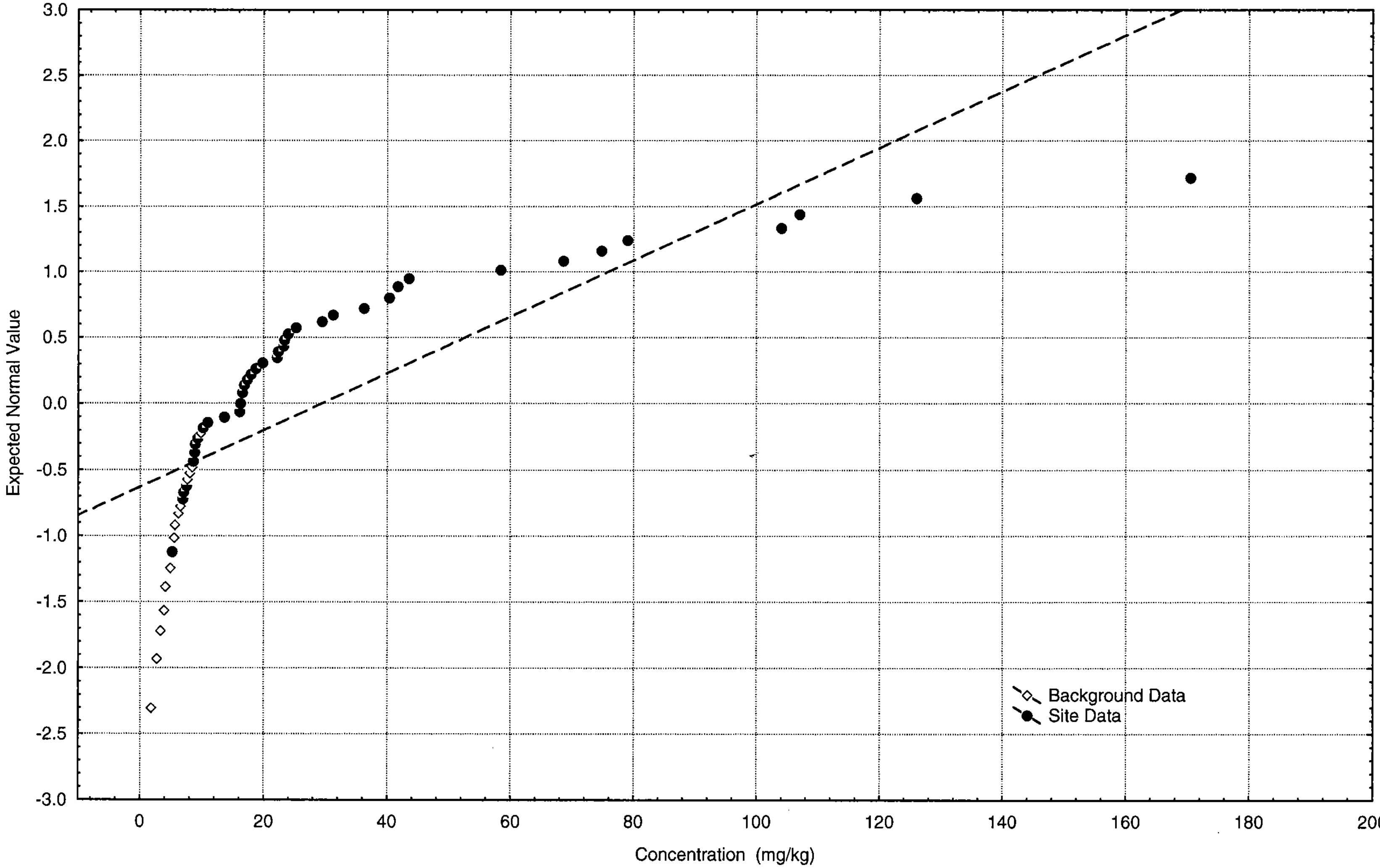
APPENDIX FIGURE A-3-9
NORMAL PROBABILITY PLOT - IRON - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



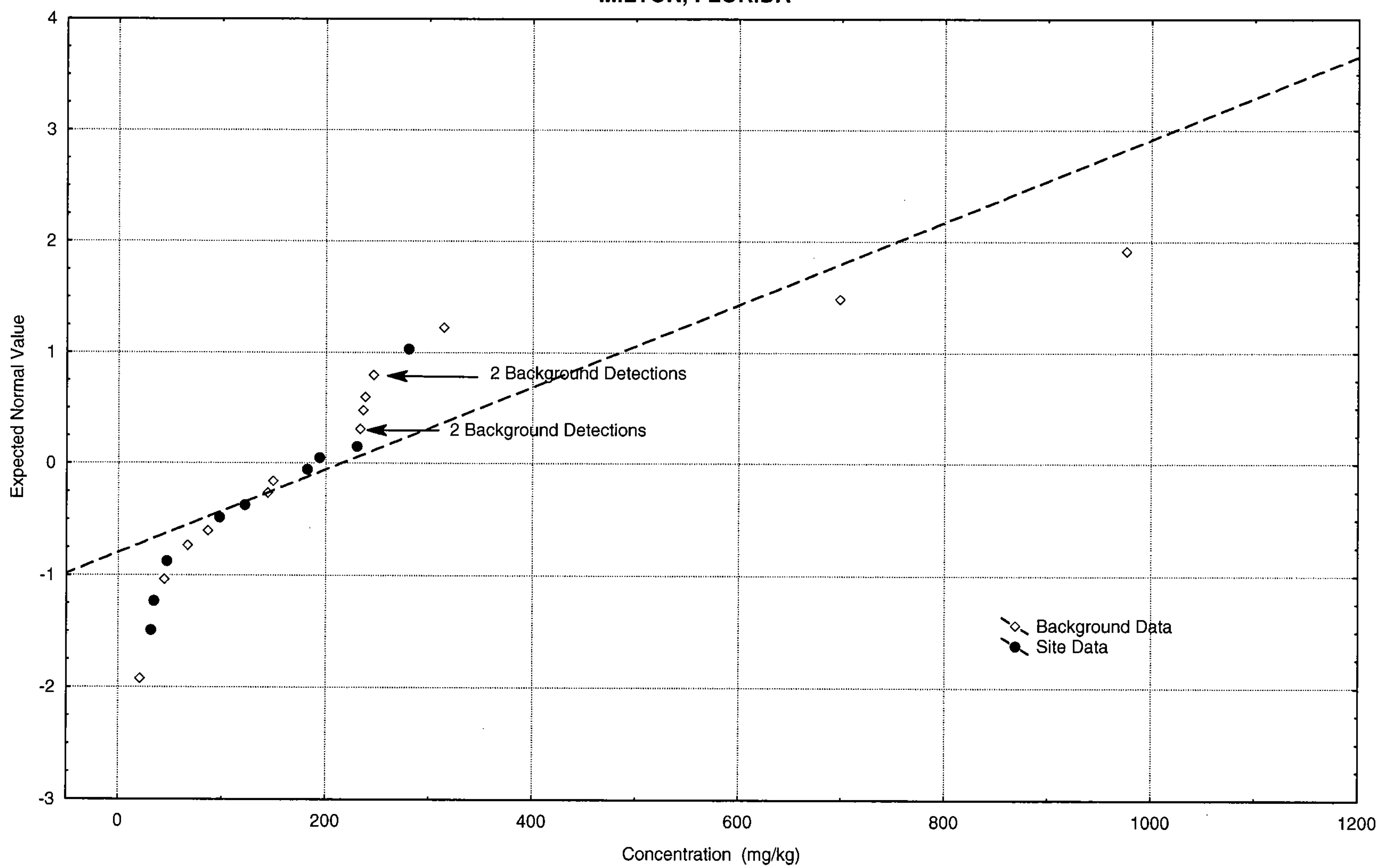
APPENDIX FIGURE A-3-10
NORMAL PROBABILITY PLOT - LEAD - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



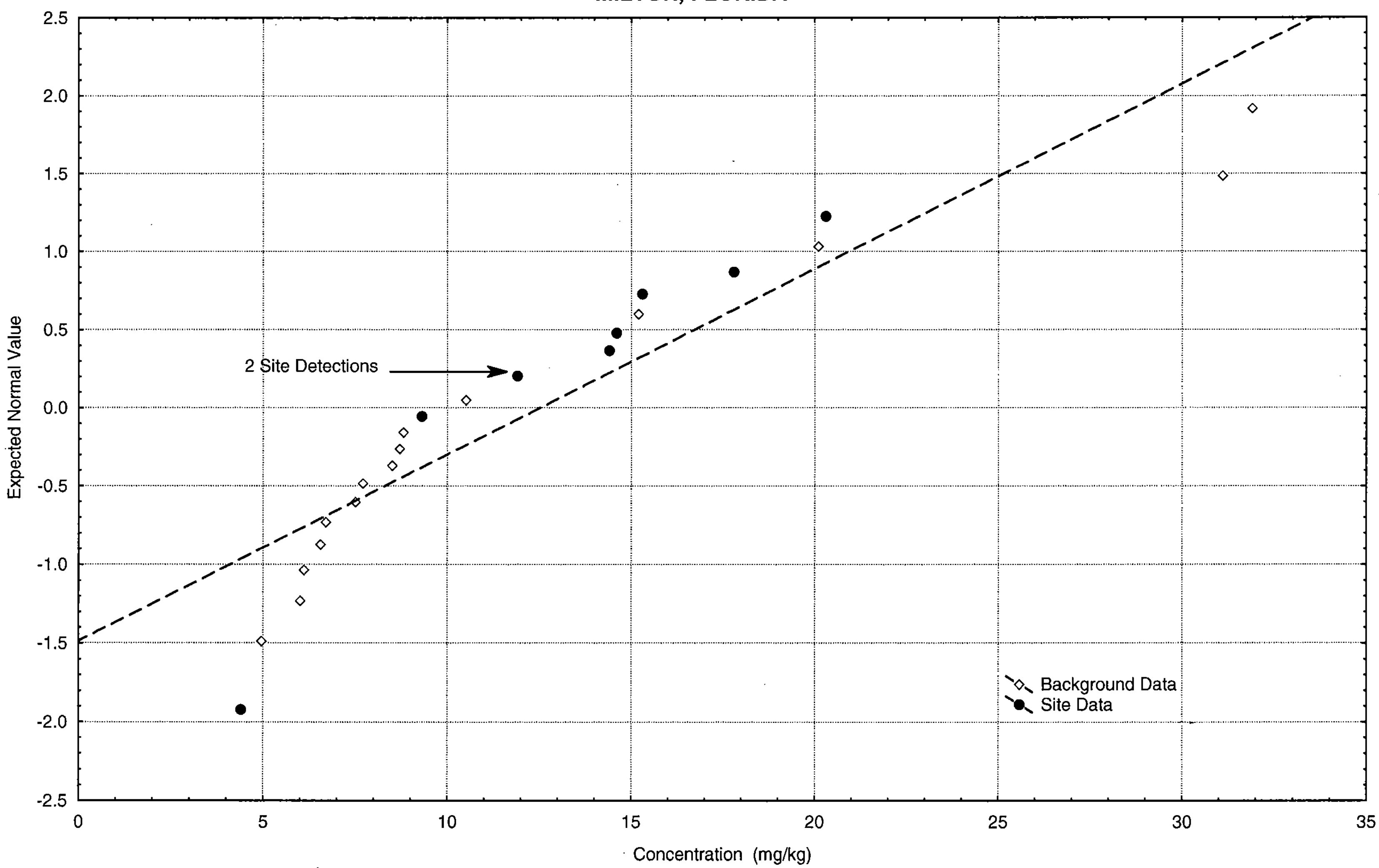
APPENDIX FIGURE A-3-11
NORMAL PROBABILITY PLOT - LEAD (excluding 11-SL-02 and 11SO38) - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



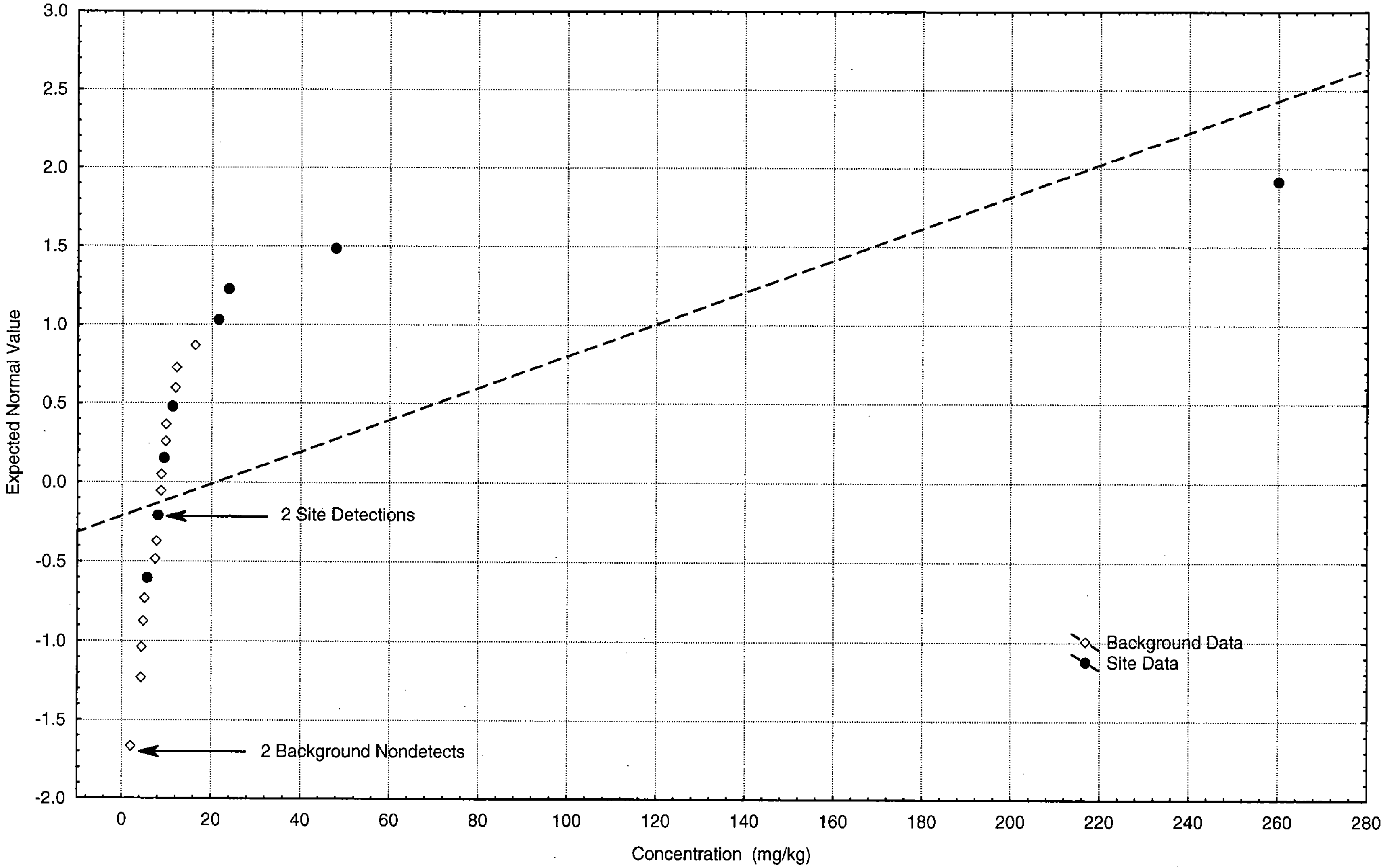
APPENDIX FIGURE A-3-12
NORMAL PROBABILITY PLOT - MANGANESE - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



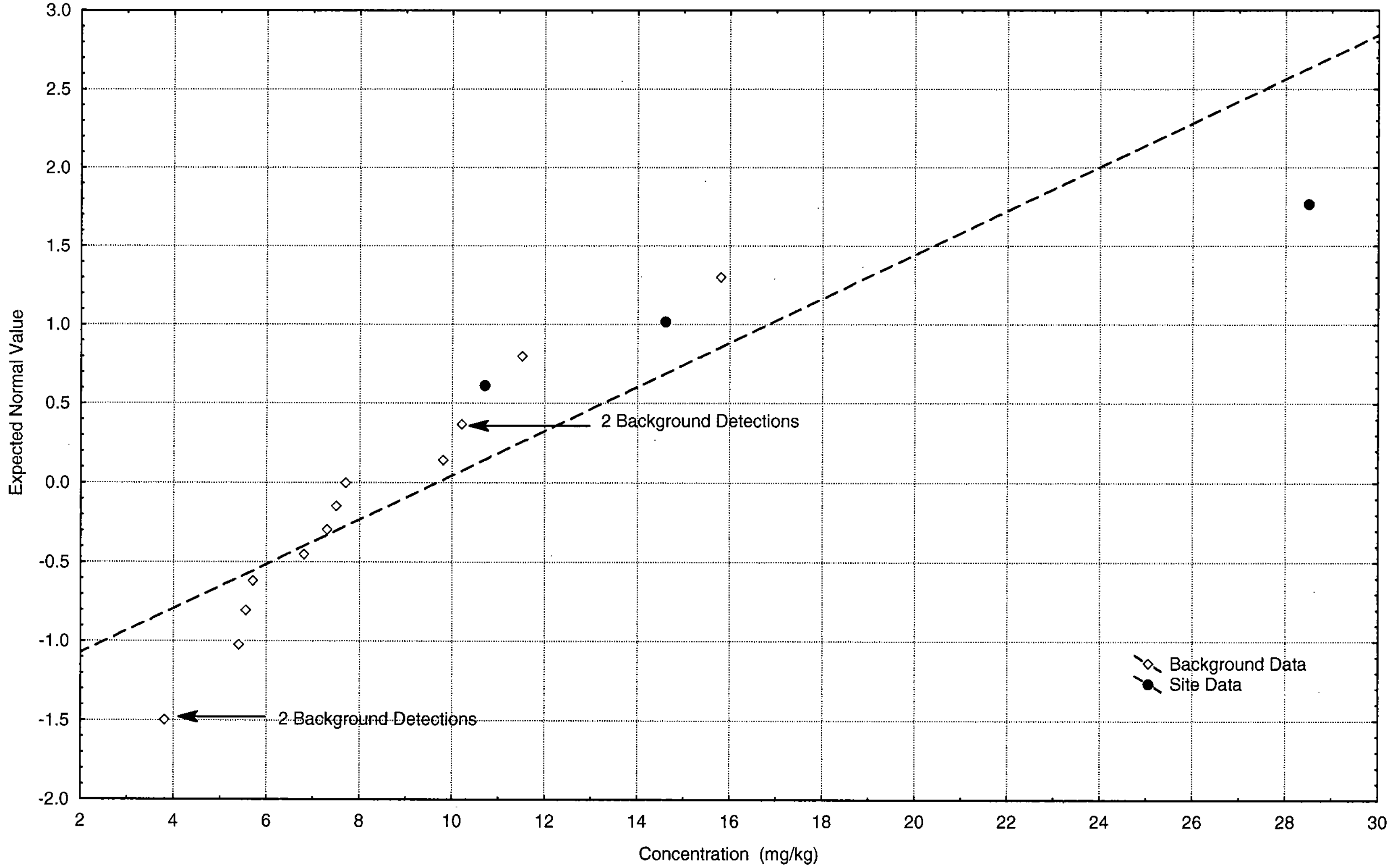
APPENDIX FIGURE A-3-13
NORMAL PROBABILITY PLOT - VANADIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



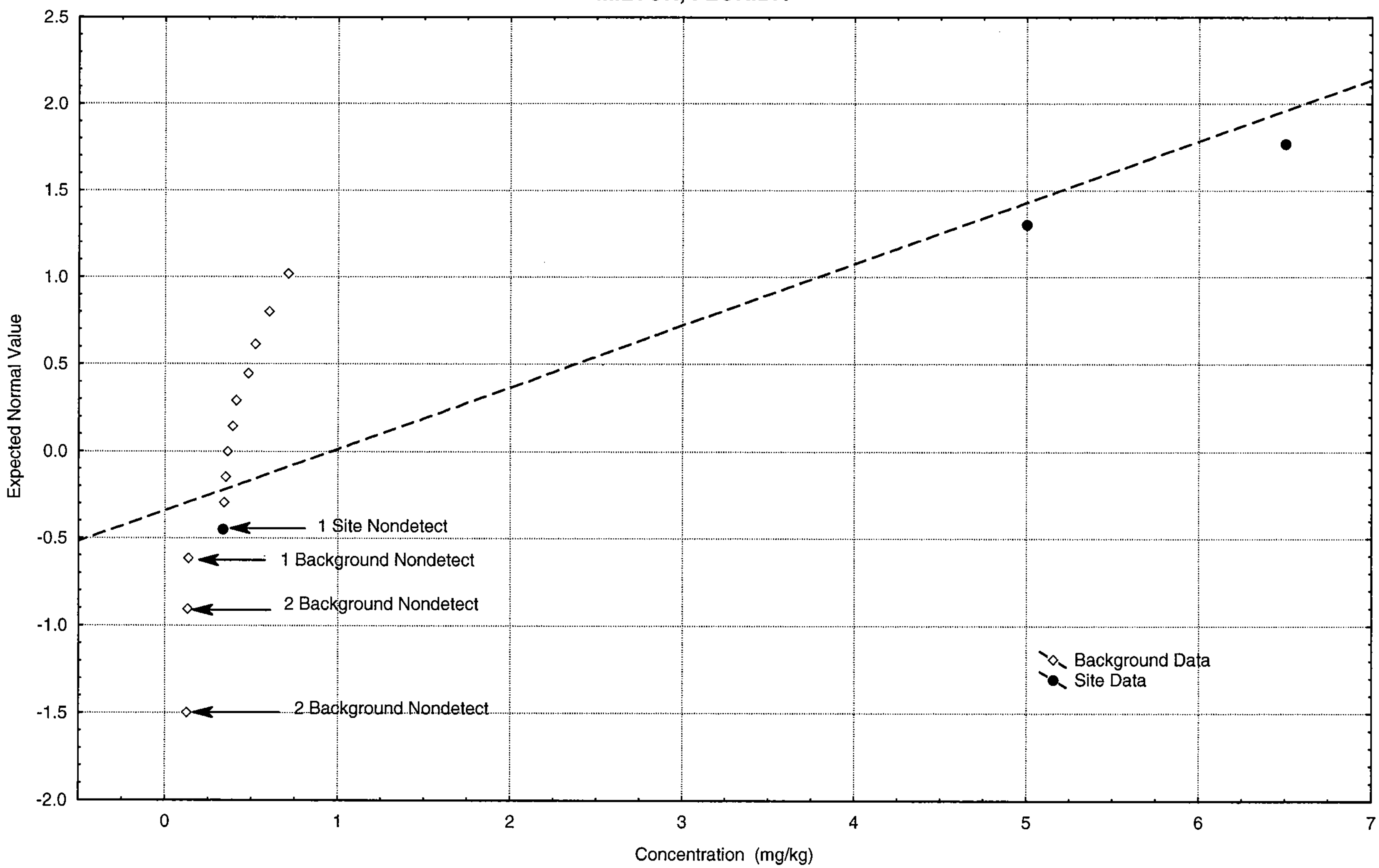
APPENDIX FIGURE A-3-14
NORMAL PROBABILITY PLOT - ZINC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



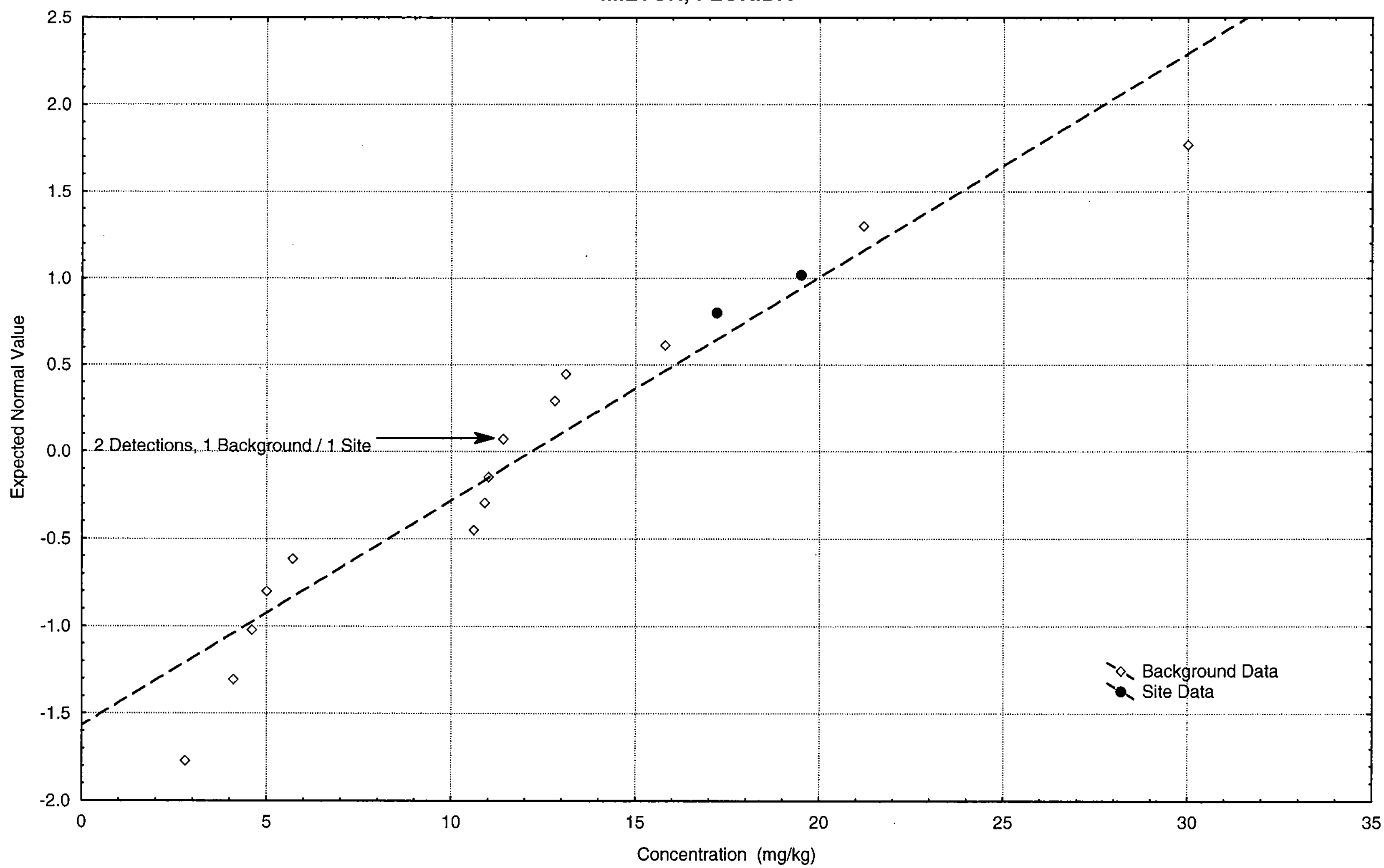
APPENDIX FIGURE A-3-15
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



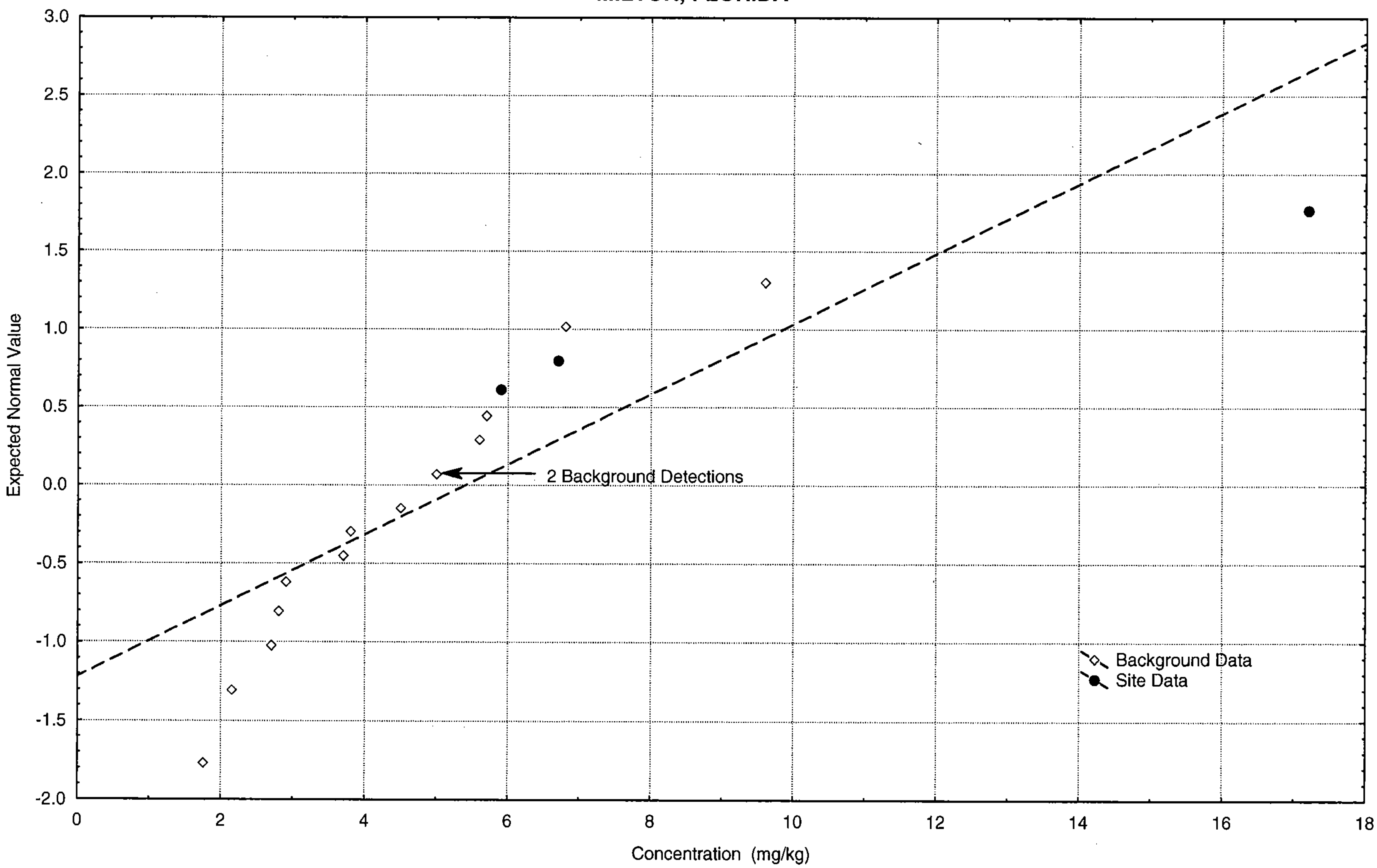
APPENDIX FIGURE A-3-16
NORMAL PROBABILITY PLOT - CADMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-3-17
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-3-18
NORMAL PROBABILITY PLOT - COPPER - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.4

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 12, TETRAETHYL LEAD DISPOSAL AREA

APPENDIX TABLE A-4-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012
LOCATION	12S001	12S002	12S003	12S004	12S005	12S006
NSAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995	1/5/1996	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)						
1,1,1-TRICHLOROETHANE	11 U	12 U	12 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 UJ	12 U	12 UJ	12 UJ	11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	12 U	12 U	12 U	12 U	11 U
2-BUTANONE	11 U	12 U	12 U	12 U	12 U	11 U
2-HEXANONE	11 U	12 UJ	12 U	12 UJ	12 UJ	11 U
4-METHYL-2-PENTANONE	11 U	12 U	12 U	12 U	12 U	11 U
ACETONE	11 U	12 U	12 U	12 U	12 U	11 U
BENZENE	11 U	12 U	12 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	12 U	12 U	12 U	12 U	11 U
BROMOFORM	11 U	12 U	12 U	12 U	12 U	11 U
BROMOMETHANE	11 U	12 U	12 U	12 U	12 U	11 U
CARBON DISULFIDE	11 U	12 U	12 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROBENZENE	11 U	12 U	12 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROETHANE	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROFORM	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROMETHANE	11 U	12 U	12 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	12 U	12 U	11 U
ETHYLBENZENE	11 U	12 U	12 U	12 U	12 U	11 U
METHYLENE CHLORIDE	11 U	12 U	12 U	12 U	12 U	11 U
STYRENE	11 U	12 U	12 U	12 U	12 U	11 U
TETRACHLOROETHENE	11 U	12 U	12 U	12 U	12 U	11 U
TOLUENE	11 U	12 U	12 U	12 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	12 U	12 U	12 U	12 U	11 U
TOTAL XYLENES	11 U	12 U	12 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	12 U	12 U	11 U
TRICHLOROETHENE	11 U	12 UJ	12 U	12 UJ	12 UJ	11 U
VINYL CHLORIDE	11 U	12 U	12 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)						
1,2,4-TRICHLOROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
1,2-DICHLOROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
1,3-DICHLOROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
1,4-DICHLOROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
2,4,5-TRICHLOROPHENOL	940 U	980 U	970 U	980 U	1000 U	940 U

APPENDIX TABLE A-4-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012
LOCATION	12S001	12S002	12S003	12S004	12S005	12S006
NSAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995	1/5/1996	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
2,4-DICHLOROPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
2,4-DIMETHYLPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
2,4-DINITROPHENOL	940 U	980 U	970 U	980 U	1000 U	940 U
2,4-DINITROTOLUENE	370 U	390 U	390 U	390 U	410 U	370 U
2,6-DINITROTOLUENE	370 U	390 U	390 U	390 U	410 U	370 U
2-CHLORONAPHTHALENE	370 U	390 U	390 U	390 U	410 U	370 U
2-CHLOROPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
2-METHYLNAPHTHALENE	370 U	390 U	390 U	390 U	410 U	370 U
2-METHYLPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
2-NITROANILINE	940 U	980 U	970 U	980 U	1000 U	940 U
2-NITROPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
3,3'-DICHLOROBENZIDINE	370 U	390 U	390 U	390 U	410 U	370 U
3-NITROANILINE	940 U	980 U	970 U	980 U	1000 U	940 U
4,6-DINITRO-2-METHYLPHENOL	940 U	980 U	970 U	980 U	1000 U	940 U
4-BROMOPHENYL PHENYL ETHER	370 U	390 U	390 U	390 U	410 U	370 U
4-CHLORO-3-METHYLPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
4-CHLOROANILINE	370 U	390 U	390 U	390 U	410 U	370 U
4-METHYLPHENOL	370 U	390 U	390 U	390 U	410 U	370 U
4-NITROANILINE	940 U	980 U	970 U	980 U	1000 U	940 U
4-NITROPHENOL	940 U	980 U	970 U	980 U	1000 U	940 U
ACENAPHTHENE	370 U	390 U	390 U	390 U	410 U	370 U
ACENAPHTHYLENE	370 U	390 U	390 U	390 U	410 U	370 U
ANTHRACENE	370 U	390 U	390 U	390 U	410 U	370 U
BENZO(A)ANTHRACENE	370 U	390 U	390 U	390 U	410 U	370 U
BENZO(A)PYRENE	370 U	390 U	390 U	390 U	410 U	370 U
BENZO(B)FLUORANTHENE	370 U	390 U	390 U	390 U	47 J	370 U
BENZO(G,H,I)PERYLENE	370 U	390 U	390 U	390 U	410 U	370 U
BENZO(K)FLUORANTHENE	370 U	390 U	390 U	390 U	54 J	370 U
BIS(2-CHLOROETHOXY)METHANE	370 U	390 U	390 U	390 U	410 U	370 U
BIS(2-CHLOROETHYL)ETHER	370 U	390 U	390 U	390 U	410 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	390 U	390 U	47 J	51 J	370 U
BUTYL BENZYL PHTHALATE	370 U	390 U	390 U	390 U	410 U	370 U
CHRYSENE	370 U	390 U	390 U	390 U	410 U	370 U
DI-N-BUTYL PHTHALATE	370 U	390 U	390 U	390 U	410 U	370 U
DI-N-OCTYL PHTHALATE	370 U	390 U	390 U	390 U	410 U	370 U
DIBENZO(A,H)ANTHRACENE	370 U	390 U	390 U	390 U	410 U	370 U
DIBENZOFURAN	370 U	390 U	390 U	390 U	410 U	370 U
DIETHYL PHTHALATE	370 U	390 U	390 U	390 U	410 U	370 U
DIMETHYL PHTHALATE	370 UJ	390 U	390 UJ	390 U	410 U	370 UJ

APPENDIX TABLE A-4-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012
LOCATION	12S001	12S002	12S003	12S004	12S005	12S006
NSAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995	1/5/1996	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	370 U	390 U	390 U	390 U	68 J	370 U
FLUORENE	370 U	390 U	390 U	390 U	410 U	370 U
HEXACHLOROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
HEXACHLOROBUTADIENE	370 U	390 U	390 U	390 U	410 U	370 U
HEXACHLOROCYCLOPENTADIENE	370 U	390 U	390 U	390 U	410 U	370 U
HEXACHLOROETHANE	370 U	390 U	390 U	390 U	410 U	370 U
INDENO(1,2,3-CD)PYRENE	370 U	390 U	390 U	390 U	410 U	370 U
ISOPHORONE	370 U	390 U	390 U	390 U	410 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	390 U	390 U	390 U	410 U	370 U
N-NITROSODIPHENYLAMINE	370 U	390 U	390 U	390 U	410 U	370 U
NAPHTHALENE	370 U	390 U	390 U	390 U	410 U	370 U
NITROBENZENE	370 U	390 U	390 U	390 U	410 U	370 U
PENTACHLOROPHENOL	940 U	980 U	970 U	980 U	1000 U	940 U
PHENANTHRENE	370 U	390 U	390 U	390 U	410 U	370 U
PHENOL	370 U	390 U	390 U	390 U	410 U	370 U
PYRENE	370 U	390 U	390 U	390 U	55 J	370 U
Pesticides PCBs (ug/kg)						
4,4'-DDD	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
4,4'-DDE	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
4,4'-DDT	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
ALDRIN	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
ALPHA-BHC	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
ALPHA-CHLORDANE	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
AROCLOR-1016	37 U	39 U	38 U	39 U	41 U	37 U
AROCLOR-1221	75 U	79 U	78 U	79 U	84 U	75 U
AROCLOR-1232	37 U	39 U	38 U	39 U	41 U	37 U
AROCLOR-1242	37 U	39 U	38 U	39 U	41 U	37 U
AROCLOR-1248	37 U	39 U	38 U	39 U	41 U	37 U
AROCLOR-1254	37 U	39 U	38 U	39 U	41 U	37 U
AROCLOR-1260	37 U	39 U	38 U	39 U	41 U	37 U
BETA-BHC	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
DELTA-BHC	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
DIELDRIN	3.7 U	3.3	3.8 U	6.2	13	3.7 U
ENDOSULFAN I	1.9 U	2 UJ	2 U	2 UJ	2.1 UJ	1.9 U
ENDOSULFAN II	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
ENDOSULFAN SULFATE	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
ENDRIN	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
ENDRIN KETONE	3.7 U	3.9 U	3.8 U	3.9 U	4.1 U	3.7 U
GAMMA-BHC (LINDANE)	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
GAMMA-CHLORDANE	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U

APPENDIX TABLE A-4-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012
LOCATION	12S001	12S002	12S003	12S004	12S005	12S006
NSAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SAMPLE	12S00101	12S00201	12S00301	12S00401	12S00501	12S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/7/1995	1/5/1996	12/7/1995	1/5/1996	1/5/1996	12/7/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
HEPTACHLOR EPOXIDE	1.9 U	2 U	2 U	2 U	2.1 U	1.9 U
METHOXYCHLOR	19 U	20 U	20 U	20 U	21 U	19 U
TOXAPHENE	190 U	200 U	200 U	200 U	210 U	190 U
Inorganics (mg/kg)						
ALUMINUM	15300	7000	9860	14600	8270	14600
ANTIMONY	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	3.8	2.4	2.7	3.6	2.7	2.6
BARIUM	11.5 J	10 J	11.3 J	11.4 J	14.5 J	11.8 J
BERYLLIUM	1 UJ	0.08 J	1 UJ	0.11 J	0.14 J	1 UJ
CADMIUM	1 U	1 U	1 U	0.41 J	1 U	1 U
CALCIUM	201 J	425 J	292 J	455 J	985 J	67.4 J
CHROMIUM	20.3	8.4	8.8	12.9	8.1	12.3
COBALT	0.44 J	0.85 J	0.84 J	10 U	0.94 J	0.96 J
COPPER	5 UJ	5 UJ	5 UJ	5.8 J	3.9 J	5 UJ
IRON	9200	5590	7170	8220	5190	8300
LEAD	7.1 J	15.6	15.2 J	14.8	15.5	5.8 J
MAGNESIUM	141 J	88.2 J	118 J	135 J	161 J	126 J
MANGANESE	120 J	82.6	102 J	78.3	156	147 J
MERCURY	0.04 J	0.1 U	0.02 J	0.1 U	0.1 U	0.03 J
NICKEL	4.1 J	1.6 J	8 U	2.6 J	1.7 J	5.2 J
POTASSIUM	1000 U	1000 U	1000 U	131 J	97.5 J	1000 U
SELENIUM	0.36 J	1 UJ	1 UJ	1 UJ	1 U	1 UJ
SILVER	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	188 J	1000 UJ	180 J	181 J	1000 UJ
THALLIUM	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	26.8	12.5	21.2	22.6	14.3	23.4
ZINC	4 U	5.2	4 U	8.4	6	4 U
Miscellaneous Parameters (mg/kg)						
CYANIDE	0.5 U	0.09 J	0.5 U	0.13 J	0.1 J	0.5 U
Petroleum Hydrocarbons (mg/kg)						
TOTAL PETROLEUM HYDROCARBONS	10.6	11	21.1	25.3	56.8	13.8

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
LOCATION	12-SL-01	12-SL-02	12-SL-03	12-SL-04	12-SL-04	12-SL-04	12-SL-05	12-SL-06	12-SL-07	12-SL-08	12B001
NSAMPLE	12-SS-01	12-SS-02	12-SS-03	12-SS-04	12-SS-04-AVG	12-SS-04-D	12-SS-05	12-SS-06	12-SS-07	12-SS-08	12B00101
SAMPLE	12-SS1	12-SS2	12-SS3	12-SS4	12-SS-04-AVG	12-SS4A	12-SS5	12-SS6	12-SS7	12-SS8	12B00101
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE											11 U
1,1,2,2-TETRACHLOROETHANE											11 U
1,1,2-TRICHLOROETHANE											11 U
1,1-DICHLOROETHANE											11 U
1,1-DICHLOROETHENE											11 U
1,2-DICHLOROETHANE											11 U
1,2-DICHLOROPROPANE											11 U
2-BUTANONE											11 U
2-HEXANONE											11 U
4-METHYL-2-PENTANONE											11 U
ACETONE											11 U
BENZENE											11 U
BROMODICHLOROMETHANE											11 U
BROMOFORM											11 U
BROMOMETHANE											11 U
CARBON DISULFIDE											11 U
CARBON TETRACHLORIDE											11 U
CHLOROBENZENE											11 U
CHLORODIBROMOMETHANE											11 U
CHLOROETHANE											11 U
CHLOROFORM											11 U
CHLOROMETHANE											11 UJ
CIS-1,3-DICHLOROPROPENE											11 U
ETHYLBENZENE											11 U
METHYLENE CHLORIDE											11 U
STYRENE											11 U
TETRACHLOROETHENE											11 U
TOLUENE											11 U
TOTAL 1,2-DICHLOROETHENE											11 U
TOTAL XYLENES											11 U
TRANS-1,3-DICHLOROPROPENE											11 U
TRICHLOROETHENE											11 U
VINYL CHLORIDE											11 U
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE											370 U
1,2-DICHLOROBENZENE											370 U
1,3-DICHLOROBENZENE											370 U
1,4-DICHLOROBENZENE											370 U
2,4,5-TRICHLOROPHENOL											920 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
LOCATION	12-SL-01	12-SL-02	12-SL-03	12-SL-04	12-SL-04	12-SL-04	12-SL-05	12-SL-06	12-SL-07	12-SL-08	12B001
NSAMPLE	12-SS-01	12-SS-02	12-SS-03	12-SS-04	12-SS-04-AVG	12-SS-04-D	12-SS-05	12-SS-06	12-SS-07	12-SS-08	12B00101
SAMPLE	12-SS1	12-SS2	12-SS3	12-SS4	12-SS-04-AVG	12-SS4A	12-SS5	12-SS6	12-SS7	12-SS8	12B00101
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL											370 U
2,4-DICHLOROPHENOL											370 U
2,4-DIMETHYLPHENOL											370 U
2,4-DINITROPHENOL											920 U
2,4-DINITROTOLUENE											370 U
2,6-DINITROTOLUENE											370 U
2-CHLORONAPHTHALENE											370 U
2-CHLOROPHENOL											370 U
2-METHYLNAPHTHALENE											370 U
2-METHYLPHENOL											370 U
2-NITROANILINE											920 U
2-NITROPHENOL											370 U
3,3'-DICHLOROBENZIDINE											370 U
3-NITROANILINE											920 U
4,6-DINITRO-2-METHYLPHENOL											920 U
4-BROMOPHENYL PHENYL ETHER											370 U
4-CHLORO-3-METHYLPHENOL											370 U
4-CHLOROANILINE											370 U
4-METHYLPHENOL											370 U
4-NITROANILINE											920 U
4-NITROPHENOL											920 U
ACENAPHTHENE											370 U
ACENAPHTHYLENE											370 U
ANTHRACENE											370 U
BENZO(A)ANTHRACENE											370 U
BENZO(A)PYRENE											370 U
BENZO(B)FLUORANTHENE											370 U
BENZO(G,H,I)PERYLENE											370 U
BENZO(K)FLUORANTHENE											370 U
BIS(2-CHLOROETHOXY)METHANE											370 U
BIS(2-CHLOROETHYL)ETHER											370 U
BIS(2-ETHYLHEXYL)PHTHALATE											370 U
BUTYL BENZYL PHTHALATE											370 U
CHRYSENE											370 U
DI-N-BUTYL PHTHALATE											370 U
DI-N-OCTYL PHTHALATE											370 U
DIBENZO(A,H)ANTHRACENE											370 U
DIBENZOFURAN											370 U
DIETHYL PHTHALATE											830
DIMETHYL PHTHALATE											370 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
LOCATION	12-SL-01	12-SL-02	12-SL-03	12-SL-04	12-SL-04	12-SL-04	12-SL-05	12-SL-06	12-SL-07	12-SL-08	12B001
NSAMPLE	12-SS-01	12-SS-02	12-SS-03	12-SS-04	12-SS-04-AVG	12-SS-04-D	12-SS-05	12-SS-06	12-SS-07	12-SS-08	12B00101
SAMPLE	12-SS1	12-SS2	12-SS3	12-SS4	12-SS-04-AVG	12-SS4A	12-SS5	12-SS6	12-SS7	12-SS8	12B00101
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE											370 U
FLUORENE											370 U
HEXACHLOROBENZENE											370 U
HEXACHLOROBUTADIENE											370 U
HEXACHLOROCYCLOPENTADIENE											370 U
HEXACHLOROETHANE											370 U
INDENO(1,2,3-CD)PYRENE											370 U
ISOPHORONE											370 U
N-NITROSO-DI-N-PROPYLAMINE											370 U
N-NITROSODIPHENYLAMINE											370 U
NAPHTHALENE											370 U
NITROBENZENE											370 U
PENTACHLOROPHENOL											920 U
PHENANTHRENE											370 U
PHENOL											370 U
PYRENE											370 U
Pesticides PCBs (ug/kg)											
4,4'-DDD											3.7 U
4,4'-DDE											3.7 U
4,4'-DDT											3.7 U
ALDRIN											1.9 U
ALPHA-BHC											1.9 U
ALPHA-CHLORDANE											1.9 U
AROCLOR-1016											37 U
AROCLOR-1221											74 U
AROCLOR-1232											37 U
AROCLOR-1242											37 U
AROCLOR-1248											37 U
AROCLOR-1254											37 U
AROCLOR-1260											37 U
BETA-BHC											1.9 U
DELTA-BHC											1.9 U
DIELDRIN											3.7 U
ENDOSULFAN I											1.9 U
ENDOSULFAN II											3.7 U
ENDOSULFAN SULFATE											3.7 U
ENDRIN											3.7 U
ENDRIN KETONE											3.7 U
GAMMA-BHC (LINDANE)											1.9 U
GAMMA-CHLORDANE											1.9 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
LOCATION	12-SL-01	12-SL-02	12-SL-03	12-SL-04	12-SL-04	12-SL-04	12-SL-05	12-SL-06	12-SL-07	12-SL-08	12B001
NSAMPLE	12-SS-01	12-SS-02	12-SS-03	12-SS-04	12-SS-04-AVG	12-SS-04-D	12-SS-05	12-SS-06	12-SS-07	12-SS-08	12B00101
SAMPLE	12-SS1	12-SS2	12-SS3	12-SS4	12-SS-04-AVG	12-SS4A	12-SS5	12-SS6	12-SS7	12-SS8	12B00101
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR											1.9 U
HEPTACHLOR EPOXIDE											1.9 U
METHOXYCHLOR											19 U
TOXAPHENE											190 U
Inorganics (mg/kg)											
ALUMINUM	7430	12400	12100	11400 J	10560 J	9720 J	16500	11200	8370	11700	25400
ANTIMONY	2.7 U	2.7 U	2.6 U	2.6 U	2.65 U	2.7 U	2.9 U	2.7 U	2.7 U	2.7 U	1.9 U
ARSENIC	0.74 J	0.7 J	1.2 J	1 J	0.905 J	0.81 J	1.9 J	0.76 J	0.53 J	1.6 J	5.3
BARIUM	18.8 J	15.3 J	11.5 J	8.9 J	8.3 J	7.7 J	12.2 J	11.5 J	12.2 J	13.4 J	18 J
BERYLLIUM	0.24 J	0.11 U	0.1 U	0.1 U	0.105 U	0.11 U	0.13 J	0.11 U	0.11 U	0.1 U	0.2 J
CADMIUM	0.16 J	0.15 U	0.3 J	0.25 J	0.24 J	0.23 J	0.31 J	0.34 J	0.15 U	0.2 J	0.57 J
CALCIUM	5960	666 J	760 J	2760	2115	1470	603 J	875 J	542 J	954 J	495 J
CHROMIUM	5.8	12.5	12.3	9.2	10.5	11.8	13.1	10.3	6	10.7	19.9
COBALT	1.1 U	1.2 J	1.5 J	1.1 U	1.1 U	1.1 U	1.2 U	1.1 J	1.1 J	1.6 J	0.51 U
COPPER	5.9	6.5	6	4.7 J	4.3 J	3.9 J	7.2	5.3 J	4 J	5.8	6.3 U
IRON	3780	5920	5810	6550 J	6350 J	6150 J	8920	6890	4030	6100	16100
LEAD	29.9	4.3	14.5	8.8	8.4	8	11.3	10.1	3.8	12.2	4.7 J
MAGNESIUM	1130	197 J	231 J	169 J	203.5 J	238 J	157 J	141 J	132 J	180 J	170 J
MANGANESE	222	190	111	82.5	94.75	107	74.9	121	179	146	7.7
MERCURY	0.04 J	0.04 J	0.03 U	0.01 U	0.02 U	0.03 U	0.03 U	0.03 J	0.03 U	0.03 J	0.04 J
NICKEL	1.6 U	1.6 U	2.7 J	2.4 J	2.3 J	2.2 J	1.9 J	1.6 U	2.3 J	3.3 J	2.5 J
POTASSIUM	232 J	203 J	202 J	166 UJ	156 UJ	146 UJ	155 J	162 J	178 J	177 J	81.2 J
SELENIUM	0.24 J	0.2 J	0.17 J	0.24 UJ	0.195 UJ	0.15 UJ	0.19 J	0.16 J	0.15 U	0.27 J	0.13 UJ
SILVER	0.38 U	0.38 U	0.38 U	0.37 U	0.38 U	0.39 U	0.41 U	0.38 U	0.38 U	0.38 U	0.56 U
SODIUM	225 J	177 J	179 J	221 J	214 J	207 J	169 J	187 J	187 J	169 J	49.8 U
THALLIUM	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.13 U
VANADIUM	10.4 J	16.1	15.5	16	15.3	14.6	22.9	19.3	10.3 J	17.6	41.7
ZINC	9.6 J	9.2 J	11.5	12.6 J	8.35 J	8.2 UJ	10.5	8.7 J	5.8 J	12.5	3.6 U
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.08 U
Petroleum Hydrocarbons (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS											28 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012
LOCATION	12B001	12B001	12B001
NSAMPLE	12B00101-AVG	12B00101-D	12B00102
SAMPLE	12B00101-AVG	12B00101D	12B00102
SUBMATRIX	SB	SB	SB
SACODE	AVG	DUP	NORMAL
DEPTH RANGE	5 - 6	5 - 6	10 - 11
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)			
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	12 U
1,2-DICHLOROPROPANE	11 U	11 U	12 U
2-BUTANONE	11 U	11 U	12 U
2-HEXANONE	11 U	11 U	12 U
4-METHYL-2-PENTANONE	11 U	11 U	12 U
ACETONE	11 U	11 U	12 U
BENZENE	11 U	11 U	12 U
BROMODICHLOROMETHANE	11 U	11 U	12 U
BROMOFORM	11 U	11 U	12 U
BROMOMETHANE	11 U	11 U	12 U
CARBON DISULFIDE	11 U	11 U	12 U
CARBON TETRACHLORIDE	11 U	11 U	12 U
CHLOROBENZENE	11 U	11 U	12 U
CHLORODIBROMOMETHANE	11 U	11 U	12 U
CHLOROETHANE	11 U	11 U	12 U
CHLOROFORM	11 U	11 U	12 U
CHLOROMETHANE	11 UJ	11 UJ	12 UJ
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U
ETHYLBENZENE	11 U	11 U	12 U
METHYLENE CHLORIDE	11 U	11 U	1 J
STYRENE	11 U	11 U	12 U
TETRACHLOROETHENE	11 U	11 U	12 U
TOLUENE	11 U	11 U	12 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	12 U
TOTAL XYLENES	11 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U
TRICHLOROETHENE	11 U	11 U	12 U
VINYL CHLORIDE	11 U	11 U	12 U
Semivolatile Organics (ug/kg)			
1,2,4-TRICHLOROBENZENE	370 U	370 U	390 U
1,2-DICHLOROBENZENE	370 U	370 U	390 U
1,3-DICHLOROBENZENE	370 U	370 U	390 U
1,4-DICHLOROBENZENE	370 U	370 U	390 U
2,4,5-TRICHLOROPHENOL	920 U	920 U	980 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012
LOCATION	12B001	12B001	12B001
NSAMPLE	12B00101-AVG	12B00101-D	12B00102
SAMPLE	12B00101-AVG	12B00101D	12B00102
SUBMATRIX	SB	SB	SB
SACODE	AVG	DUP	NORMAL
DEPTH RANGE	5 - 6	5 - 6	10 - 11
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	370 U	370 U	390 U
2,4-DICHLOROPHENOL	370 U	370 U	390 U
2,4-DIMETHYLPHENOL	370 U	370 U	390 U
2,4-DINITROPHENOL	920 U	920 U	980 U
2,4-DINITROTOLUENE	370 U	370 U	390 U
2,6-DINITROTOLUENE	370 U	370 U	390 U
2-CHLORONAPHTHALENE	370 U	370 U	390 U
2-CHLOROPHENOL	370 U	370 U	390 U
2-METHYLNAPHTHALENE	370 U	370 U	390 U
2-METHYLPHENOL	370 U	370 U	390 U
2-NITROANILINE	920 U	920 U	980 U
2-NITROPHENOL	370 U	370 U	390 U
3,3'-DICHLOROBENZIDINE	370 U	370 U	390 UJ
3-NITROANILINE	920 U	920 U	980 U
4,6-DINITRO-2-METHYLPHENOL	920 U	920 U	980 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	390 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	390 U
4-CHLOROANILINE	370 U	370 U	390 U
4-METHYLPHENOL	370 U	370 U	390 U
4-NITROANILINE	920 U	920 U	980 U
4-NITROPHENOL	920 U	920 U	980 U
ACENAPHTHENE	370 U	370 U	390 U
ACENAPHTHYLENE	370 U	370 U	390 U
ANTHRACENE	370 U	370 U	390 U
BENZO(A)ANTHRACENE	370 U	370 U	390 U
BENZO(A)PYRENE	370 U	370 U	390 U
BENZO(B)FLUORANTHENE	370 U	370 U	390 U
BENZO(G,H,I)PERYLENE	370 U	370 U	390 U
BENZO(K)FLUORANTHENE	370 U	370 U	390 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	390 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	370 U	390 UJ
BUTYL BENZYL PHTHALATE	370 U	370 U	390 UJ
CHRYSENE	370 U	370 U	390 U
DI-N-BUTYL PHTHALATE	370 U	370 U	390 U
DI-N-OCTYL PHTHALATE	370 U	370 U	390 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	390 U
DIBENZOFURAN	370 U	370 U	390 U
DIETHYL PHTHALATE	507.5	370 U	390 U
DIMETHYL PHTHALATE	370 U	370 U	390 U

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012
LOCATION	12B001	12B001	12B001
NSAMPLE	12B00101-AVG	12B00101-D	12B00102
SAMPLE	12B00101-AVG	12B00101D	12B00102
SUBMATRIX	SB	SB	SB
SACODE	AVG	DUP	NORMAL
DEPTH RANGE	5 - 6	5 - 6	10 - 11
STATUS	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB
FLUORANTHENE	370 U	370 U	390 U
FLUORENE	370 U	370 U	390 U
HEXACHLOROBENZENE	370 U	370 U	390 U
HEXACHLOROBUTADIENE	370 U	370 U	390 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	390 U
HEXACHLOROETHANE	370 U	370 U	390 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	390 U
ISOPHORONE	370 U	370 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	390 U
N-NITROSODIPHENYLAMINE	370 U	370 U	390 U
NAPHTHALENE	370 U	370 U	390 U
NITROBENZENE	370 U	370 U	390 U
PENTACHLOROPHENOL	920 U	920 U	980 U
PHENANTHRENE	370 U	370 U	390 U
PHENOL	370 U	370 U	390 U
PYRENE	370 U	370 U	390 U
Pesticides PCBs (ug/kg)			
4,4'-DDD	3.7 UJ	3.7 UJ	3.9 UJ
4,4'-DDE	3.7 UJ	3.7 UJ	3.9 UJ
4,4'-DDT	3.7 UJ	3.7 UJ	3.9 UJ
ALDRIN	1.9 UJ	1.9 UJ	2 UJ
ALPHA-BHC	1.9 UJ	1.9 UJ	2 UJ
ALPHA-CHLORDANE	1.9 UJ	1.9 UJ	2 UJ
AROCLOR-1016	37 UJ	37 UJ	39 UJ
AROCLOR-1221	74 UJ	74 UJ	79 UJ
AROCLOR-1232	37 UJ	37 UJ	39 UJ
AROCLOR-1242	37 UJ	37 UJ	39 UJ
AROCLOR-1248	37 UJ	37 UJ	39 UJ
AROCLOR-1254	37 UJ	37 UJ	39 UJ
AROCLOR-1260	37 UJ	37 UJ	39 UJ
BETA-BHC	1.9 UJ	1.9 UJ	2 UJ
DELTA-BHC	1.9 UJ	1.9 UJ	2 UJ
DIELDRIN	3.7 UJ	3.7 UJ	3.9 UJ
ENDOSULFAN I	1.9 UJ	1.9 UJ	2 UJ
ENDOSULFAN II	3.7 UJ	3.7 UJ	3.9 UJ
ENDOSULFAN SULFATE	3.7 UJ	3.7 UJ	3.9 UJ
ENDRIN	3.7 UJ	3.7 UJ	3.9 UJ
ENDRIN KETONE	3.7 UJ	3.7 UJ	3.9 UJ
GAMMA-BHC (LINDANE)	1.9 UJ	1.9 UJ	2 UJ
GAMMA-CHLORDANE	1.9 UJ	1.9 UJ	2 UJ

APPENDIX TABLE A-4-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0012**	**0012**	**0012**
LOCATION	**12B001**	**12B001**	**12B001**
NSAMPLE	**12B00101-AVG**	**12B00101-D**	**12B00102**
SAMPLE	**12B00101-AVG**	**12B00101D**	**12B00102**
SUBMATRIX	**SB**	**SB**	**SB**
SACODE	**AVG**	**DUP**	**NORMAL**
DEPTH RANGE	**5 - 6**	**5 - 6**	**10 - 11**
STATUS	**NORMAL**	**NORMAL**	**NORMAL**
SAMPLE DATE	**5/21/1996**	**5/21/1996**	**5/21/1996**
COLLECTION METHOD	**GRAB**	**GRAB**	**GRAB**
HEPTACHLOR	1.9 UJ	1.9 UJ	2 UJ
HEPTACHLOR EPOXIDE	1.9 UJ	1.9 UJ	2 UJ
METHOXYCHLOR	19 UJ	19 UJ	20 UJ
TOXAPHENE	190 UJ	190 UJ	200 UJ
Inorganics (mg/kg)			
ALUMINUM	17145	8890	5260
ANTIMONY	1.9 U	1.9 U	2 U
ARSENIC	3.25 J	1.2 J	2 J
BARIUM	16.25 J	14.5 J	8.2 J
BERYLLIUM	0.1175 J	0.07 U	0.1 J
CADMIUM	0.3525 J	0.27 U	0.28 U
CALCIUM	523.5 J	552 J	230 J
CHROMIUM	14.5	9.1	9.3
COBALT	0.51 U	0.51 U	0.54 U
COPPER	4.6 U	2.9 U	4.3 U
IRON	12360	8620	7340
LEAD	4.05 J	3.4 J	3.8 J
MAGNESIUM	133.35 J	96.7 J	127 J
MANGANESE	6.3	4.9	8.4
MERCURY	0.04 J	0.04 J	0.03 U
NICKEL	1.65 J	1.6 U	1.7 U
POTASSIUM	58.15 J	70.2 UJ	166 J
SELENIUM	0.13 UJ	0.13 U	0.14 U
SILVER	0.56 U	0.56 U	0.59 U
SODIUM	41.6 U	33.4 U	47 U
THALLIUM	0.13 U	0.13 U	0.14 U
VANADIUM	34.1	26.5	38.1
ZINC	3.65 U	3.7 U	3 U
Miscellaneous Parameters (mg/kg)			
CYANIDE	0.08 U	0.08 U	0.09 U
Petroleum Hydrocarbons (mg/kg)			
TOTAL PETROLEUM HYDROCARBONS	28 U	28 U	29 U

APPENDIX TABLE A-4-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0012**	**0012**	**0012**	**0012**	**0012**	**0012**
LOCATION	**12S001**	**12S002**	**12S003**	**12S004**	**12S005**	**12S006**
NSAMPLE	**12S00101**	**12S00201**	**12S00301**	**12S00401**	**12S00501**	**12S00601**
SAMPLE	**12S00101**	**12S00201**	**12S00301**	**12S00401**	**12S00501**	**12S00601**
SUBMATRIX	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
DEPTH RANGE	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
STATUS	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SAMPLE DATE	**12/7/1995**	**1/5/1996**	**12/7/1995**	**1/5/1996**	**1/5/1996**	**12/7/1995**
COLLECTION METHOD	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**
Semivolatile Organics (ug/kg)						
BENZO(B)FLUORANTHENE	370 U	390 U	390 U	390 U	47 J	370 U
BENZO(K)FLUORANTHENE	370 U	390 U	390 U	390 U	54 J	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	390 U	390 U	47 J	51 J	370 U
FLUORANTHENE	370 U	390 U	390 U	390 U	68 J	370 U
PYRENE	370 U	390 U	390 U	390 U	55 J	370 U
Pesticides PCBs (ug/kg)						
DIELDRIN	3.7 U	3.3	3.8 U	6.2	13	3.7 U
Inorganics (mg/kg)						
ALUMINUM	15300	7000	9860	14600	8270	14600
ARSENIC	3.8	2.4	2.7	3.6	2.7	2.6
BARIUM	11.5 J	10 J	11.3 J	11.4 J	14.5 J	11.8 J
BERYLLIUM	1 UJ	0.08 J	1 UJ	0.11 J	0.14 J	1 UJ
CADMIUM	1 U	1 U	1 U	0.41 J	1 U	1 U
CALCIUM	201 J	425 J	292 J	455 J	985 J	67.4 J
CHROMIUM	20.3	8.4	8.8	12.9	8.1	12.3
COBALT	0.44 J	0.85 J	0.84 J	10 U	0.94 J	0.96 J
COPPER	5 UJ	5 UJ	5 UJ	5.8 J	3.9 J	5 UJ
IRON	9200	5590	7170	8220	5190	8300
LEAD	7.1 J	15.6	15.2 J	14.8	15.5	5.8 J
MAGNESIUM	141 J	88.2 J	118 J	135 J	161 J	126 J
MANGANESE	120 J	82.6	102 J	78.3	156	147 J
MERCURY	0.04 J	0.1 U	0.02 J	0.1 U	0.1 U	0.03 J
NICKEL	4.1 J	1.6 J	8 U	2.6 J	1.7 J	5.2 J
POTASSIUM	1000 U	1000 U	1000 U	131 J	97.5 J	1000 U
SELENIUM	0.36 J	1 UJ	1 UJ	1 UJ	1 U	1 UJ
SODIUM	1000 UJ	188 J	1000 UJ	180 J	181 J	1000 UJ
VANADIUM	26.8	12.5	21.2	22.6	14.3	23.4
ZINC	4 U	5.2	4 U	8.4	6	4 U
Miscellaneous Parameters (mg/kg)						
CYANIDE	0.5 U	0.09 J	0.5 U	0.13 J	0.1 J	0.5 U
Petroleum Hydrocarbon (mg/kg)						
TOTAL PETROLEUM HYDROCARBONS	10.6	11	21.1	25.3	56.8	13.8

APPENDIX TABLE A-4-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012	0012
LOCATION	12-SL-01	12-SL-02	12-SL-03	12-SL-04	12-SL-04	12-SL-04	12-SL-05	12-SL-06	12-SL-07	12-SL-08	12B001	12B001	12B001	12B001
NSAMPLE	12-SS-01	12-SS-02	12-SS-03	12-SS-04	12-SS-04-AVG	12-SS-04-D	12-SS-05	12-SS-06	12-SS-07	12-SS-08	12B00101	12B00101-AVG	12B00101-D	12B00102
SAMPLE	12-SS1	12-SS2	12-SS3	12-SS4	12-SS-04-AVG	12-SS4A	12-SS5	12-SS6	12-SS7	12-SS8	12B00101	12B00101-AVG	12B00101D	12B00102
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	5 - 6	5 - 6	5 - 6	10 - 11
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	7/20/1993	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)														
METHYLENE CHLORIDE											11 U	11 U	11 U	1 J
Semivolatile Organics (ug/kg)														
DIETHYL PHTHALATE											830	507.5	370 U	390 U
Inorganics (mg/kg)														
ALUMINUM	7430	12400	12100	11400 J	10560 J	9720 J	16500	11200	8370	11700	25400	17145	8890	5260
ARSENIC	0.74 J	0.7 J	1.2 J	1 J	0.905 J	0.81 J	1.9 J	0.76 J	0.53 J	1.6 J	5.3	3.25 J	1.2 J	2 J
BARIUM	18.8 J	15.3 J	11.5 J	8.9 J	8.3 J	7.7 J	12.2 J	11.5 J	12.2 J	13.4 J	18 J	16.25 J	14.5 J	8.2 J
BERYLLIUM	0.24 J	0.11 U	0.1 U	0.1 U	0.105 U	0.11 U	0.13 J	0.11 U	0.11 U	0.1 U	0.2 J	0.1175 J	0.07 U	0.1 J
CADMIUM	0.16 J	0.15 U	0.3 J	0.25 J	0.24 J	0.23 J	0.31 J	0.34 J	0.15 U	0.2 J	0.57 J	0.3525 J	0.27 U	0.28 U
CALCIUM	5960	666 J	760 J	2760	2115	1470	603 J	875 J	542 J	954 J	495 J	523.5 J	552 J	230 J
CHROMIUM	5.8	12.5	12.3	9.2	10.5	11.8	13.1	10.3	6	10.7	19.9	14.5	9.1	9.3
COBALT	1.1 U	1.2 J	1.5 J	1.1 U	1.1 U	1.1 U	1.2 U	1.1 J	1.1 J	1.6 J	0.51 U	0.51 U	0.51 U	0.54 U
COPPER	5.9	6.5	6	4.7 J	4.3 J	3.9 J	7.2	5.3 J	4 J	5.8	6.3 U	4.6 U	2.9 U	4.3 U
IRON	3780	5920	5810	6550 J	6350 J	6150 J	8920	6890	4030	6100	16100	12360	8620	7340
LEAD	29.9	4.3	14.5	8.8	8.4	8	11.3	10.1	3.8	12.2	4.7 J	4.05 J	3.4 J	3.8 J
MAGNESIUM	1130	197 J	231 J	169 J	203.5 J	238 J	157 J	141 J	132 J	180 J	170 J	133.35 J	96.7 J	127 J
MANGANESE	222	190	111	82.5	94.75	107	74.9	121	179	146	7.7	6.3	4.9	8.4
MERCURY	0.04 J	0.04 J	0.03 U	0.01 U	0.02 U	0.03 U	0.03 U	0.03 J	0.03 U	0.03 J	0.04 J	0.04 J	0.04 J	0.03 U
NICKEL	1.6 U	1.6 U	2.7 J	2.4 J	2.3 J	2.2 J	1.9 J	1.6 U	2.3 J	3.3 J	2.5 J	1.65 J	1.6 U	1.7 U
POTASSIUM	232 J	203 J	202 J	166 UJ	156 UJ	146 UJ	155 J	162 J	178 J	177 J	81.2 J	58.15 J	70.2 UJ	166 J
SELENIUM	0.24 J	0.2 J	0.17 J	0.24 UJ	0.195 UJ	0.15 UJ	0.19 J	0.16 J	0.15 U	0.27 J	0.13 UJ	0.13 UJ	0.13 U	0.14 U
SODIUM	225 J	177 J	179 J	221 J	214 J	207 J	169 J	187 J	187 J	169 J	49.8 U	41.6 U	33.4 U	47 U
VANADIUM	10.4 J	16.1	15.5	16	15.3	14.6	22.9	19.3	10.3 J	17.6	41.7	34.1	26.5	38.1
ZINC	9.6 J	9.2 J	11.5	12.6 J	8.35 J	8.2 UJ	10.5	8.7 J	5.8 J	12.5	3.6 U	3.65 U	3.7 U	3 U

APPENDIX TABLE A-4-5
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Semivolatile Organics (ug/kg)							
BENZO(B)FLUORANTHENE	1/6	47 J	47 J	370 - 390	167	47.0	12S00501
BENZO(K)FLUORANTHENE	1/6	54 J	54 J	370 - 390	168	54.0	12S00501
BIS(2-ETHYLHEXYL)PHTHALATE	2/6	47 J	51 J	370 - 390	143	49.0	12S00501
FLUORANTHENE	1/6	68 J	68 J	370 - 390	171	68.0	12S00501
PYRENE	1/6	55 J	55 J	370 - 390	168	55.0	12S00501
Pesticides PCBs (ug/kg)							
DIELDRIN	3/6	3.3	13	3.7 - 3.8	4.68	7.50	12S00501
Inorganics (mg/kg)							
ALUMINUM	6/6	7000	15300	---	11605	11605	12S00101
ARSENIC	6/6	2.4	3.8	---	2.97	2.97	12S00101
BARIUM	6/6	10 J	14.5 J	---	11.8	11.8	12S00501
BERYLLIUM	3/6	0.08 J	0.14 J	1	0.305	0.110	12S00501
CADMIUM	1/6	0.41 J	0.41 J	1	0.485	0.410	12S00401
CALCIUM	6/6	67.4 J	985 J	---	404	404	12S00501
CHROMIUM	6/6	8.1	20.3	---	11.8	11.8	12S00101
COBALT	5/6	0.44 J	0.96 J	10	1.51	0.806	12S00601
COPPER	2/6	3.9 J	5.8 J	5	3.28	4.85	12S00401
IRON	6/6	5190	9200	---	7278	7278	12S00101
LEAD	6/6	5.8 J	15.6	---	12.3	12.3	12S00201
MAGNESIUM	6/6	88.2 J	161 J	---	128	128	12S00501
MANGANESE	6/6	78.3	156	---	114	114	12S00501
MERCURY	3/6	0.02 J	0.04 J	0.1	0.0400	0.0300	12S00101
NICKEL	5/6	1.6 J	5.2 J	8	3.20	3.04	12S00601
POTASSIUM	2/6	97.5 J	131 J	1000	371	114	12S00401
SELENIUM	1/6	0.36 J	0.36 J	1	0.477	0.360	12S00101
SODIUM	3/6	180 J	188 J	1000	342	183	12S00201
VANADIUM	6/6	12.5	26.8	---	20.1	20.1	12S00101
ZINC	3/6	5.2	8.4	4	4.27	6.53	12S00401
Miscellaneous Parameter (mg/kg)							
CYANIDE	3/6	0.09 J	0.13 J	0.5	0.178	0.107	12S00401
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	6/6	10.6	56.8	---	23.1	23.1	12S00501

APPENDIX TABLE A-4-6
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
METHYLENE CHLORIDE	1/2	1 J	1 J	11	3.25	1.00	12B00102
Semivolatile Organics (ug/kg)							
DIETHYL PHTHALATE	1/2	830	830	370 - 390	351	508	12B00101
Inorganics (mg/kg)							
ALUMINUM	10/10	5260	25400	---	11267	11267	12B00101
ARSENIC	10/10	0.53 J	5.3	---	1.36	1.36	12B00101
BARIUM	10/10	7.7 J	18.8 J	---	12.8	12.8	12-SS-01
BERYLLIUM	4/10	0.1 J	0.24 J	0.07 - 0.11	0.0905	0.147	12-SS-01
CADMIUM	7/10	0.16 J	0.57 J	0.15 - 0.28	0.219	0.272	12B00101
CALCIUM	10/10	230 J	5960	---	1323	1323	12-SS-01
CHROMIUM	10/10	5.8	19.9	---	10.5	10.5	12B00101
COBALT	5/10	1.1 J	1.6 J	0.51 - 1.2	0.873	1.30	12-SS-08
COPPER	8/10	3.9 J	7.2	2.9 - 6.3	4.95	5.63	12-SS-05
IRON	10/10	3780	16100	---	6750	6750	12B00101
LEAD	10/10	3.4 J	29.9	---	10.2	10.2	12-SS-01
MAGNESIUM	10/10	96.7 J	1130	---	263	263	12-SS-01
MANGANESE	10/10	4.9	222	---	115	115	12-SS-01
MERCURY	5/10	0.03 J	0.04 J	0.01 - 0.03	0.0250	0.0360	12-SS-01, 12-SS-02, 12B00101, 12B00101-D
NICKEL	6/10	1.9 J	3.3 J	1.6 - 1.7	1.74	2.36	12-SS-08
POTASSIUM	9/10	81.2 J	232 J	70.2 - 166	161	170	12-SS-01
SELENIUM	6/10	0.16 J	0.27 J	0.13 - 0.24	0.154	0.205	12-SS-08
SODIUM	8/10	169 J	225 J	33.4 - 49.8	155	188	12-SS-01
VANADIUM	10/10	10.3 J	41.7	---	20.0	20.0	12B00101
ZINC	8/10	5.8 J	12.6 J	3 - 8.2	7.95	9.52	12-SS-04

APPENDIX TABLE A-4-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

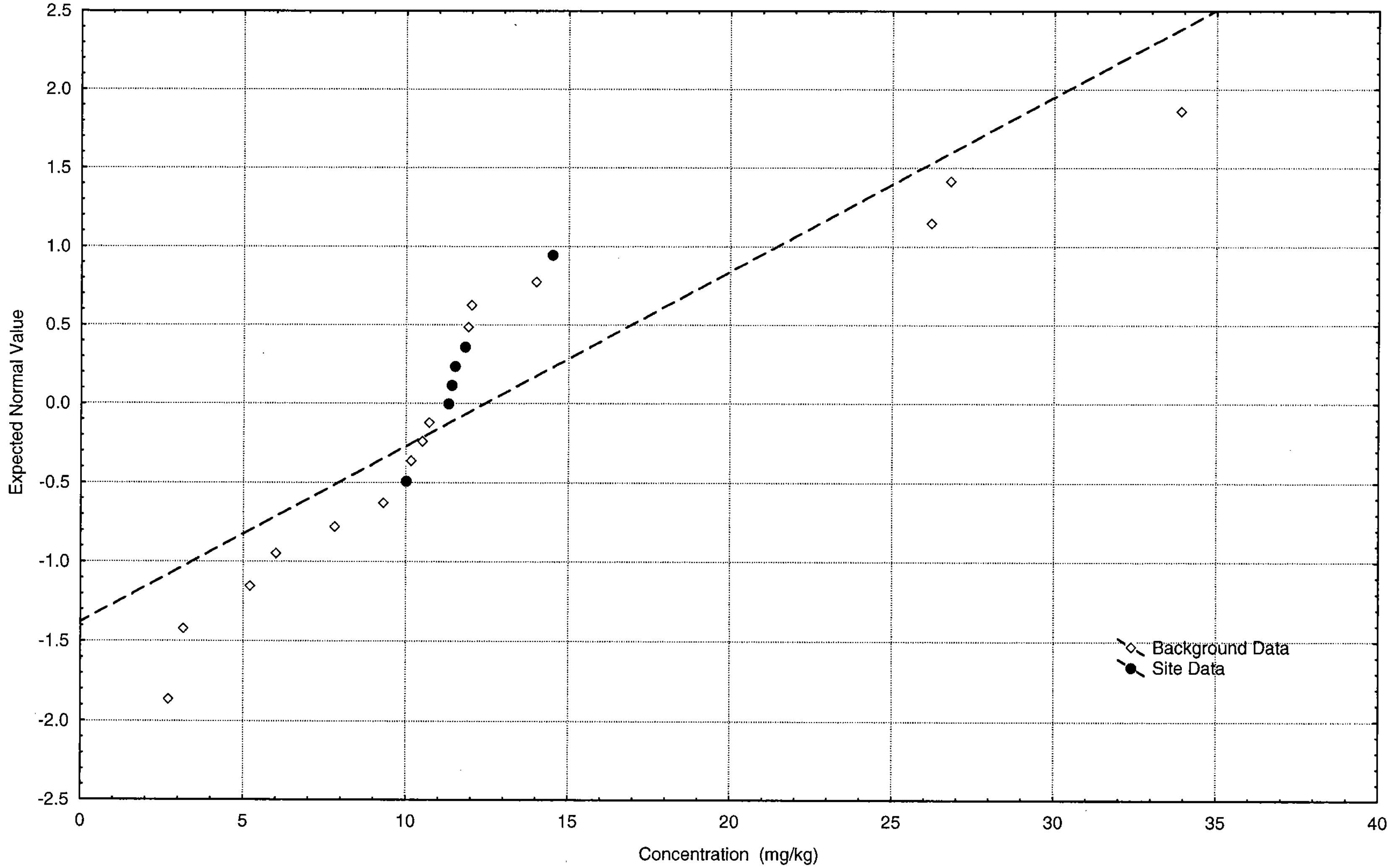
Chemical	Normal Statistics											Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Median	Standard Deviation	Coefficient of Variation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)															
METHYLENE CH	**2**	**1**	**50%**	**1.00**	**1.00**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	
Semivolatile Organics (ug/kg)															
DIETHYL PHTHA	**2**	**1**	**50%**	**508**	**508**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	
Inorganics (mg/kg)															
ALUMINUM	10	10	100%	5260	17145	11267	11267	11450	3709	0.329	0.138	Shapiro-Wilk	Normal/Lognormal	13416	Student-t
ARSENIC	10	10	100%	0.530	3.25	1.36	1.36	1.05	0.845	0.622	1.33	Shapiro-Wilk	Normal/Lognormal	2.16	H-UCL
BARIUM	10	10	100%	8.20	18.8	12.8	12.8	12.2	3.33	0.261	0.338	Shapiro-Wilk	Normal/Lognormal	14.7	Student-t
BERYLLIUM	**10**	**4**	**40%**	**0.100**	**0.240**	**0.091**	**0.147**	**0.055**	**0.061**	**0.671**	**1.92**	**Shapiro-Wilk**	**Undefined**	0.121	Non-Parametric UCL
CADMIUM	10	7	70%	0.160	0.353	0.219	0.272	0.220	0.105	0.479	-0.157	Shapiro-Wilk	Normal/Lognormal	0.353	Maximum Detected Concentration
CALCIUM	10	10	100%	230	5960	1323	1323	713	1705	1.29	2.71	Shapiro-Wilk	Lognormal	2918	H-UCL
CHROMIUM	10	10	100%	5.80	14.5	10.5	10.5	10.6	2.86	0.273	-0.598	Shapiro-Wilk	Normal/Lognormal	12.2	Student-t
COBALT	**10**	**5**	**50%**	**1.10**	**1.60**	**0.873**	**1.30**	**0.850**	**0.490**	**0.562**	**0.176**	**Shapiro-Wilk**	**Normal/Lognormal**	1.58	H-UCL
COPPER	10	8	80%	4.00	7.20	4.95	5.63	5.55	1.72	0.347	-0.646	Shapiro-Wilk	Normal/Lognormal	5.94	Student-t
IRON	10	10	100%	3780	12360	6750	6750	6225	2470	0.366	1.28	Shapiro-Wilk	Normal/Lognormal	8182	Student-t
LEAD	10	10	100%	3.80	29.9	10.2	10.2	9.25	7.96	0.777	1.85	Shapiro-Wilk	Lognormal	18.7	H-UCL
MAGNESIUM	10	10	100%	127	1130	263	263	169	307	1.16	3.08	Shapiro-Wilk	Undefined	415	Non-Parametric UCL
MANGANESE	10	10	100%	6.30	222	115	115	116	72.6	0.629	-0.246	Shapiro-Wilk	Normal	157	Student-t
MERCURY	**10**	**5**	**50%**	**0.030**	**0.040**	**0.025**	**0.036**	**0.023**	**0.012**	**0.490**	**0.227**	**Shapiro-Wilk**	**Undefined**	0.0310	Non-Parametric UCL
NICKEL	**10**	**6**	**60%**	**1.65**	**3.30**	**1.74**	**2.36**	**1.78**	**0.910**	**0.523**	**0.339**	**Shapiro-Wilk**	**Normal/Lognormal**	2.76	H-UCL
POTASSIUM	10	9	90%	58.2	232	161	170	172	54.3	0.337	-1.004	Shapiro-Wilk	Normal	193	Student-t
SELENIUM	**10**	**6**	**60%**	**0.160**	**0.270**	**0.154**	**0.205**	**0.165**	**0.074**	**0.480**	**0.142**	**Shapiro-Wilk**	**Normal/Lognormal**	0.236	H-UCL
SODIUM	10	8	80%	169	225	155	188	178	72.4	0.467	-1.487	Shapiro-Wilk	Undefined	191	Non-Parametric UCL
VANADIUM	10	10	100%	10.3	38.1	20.0	20.0	16.9	9.34	0.468	1.16	Shapiro-Wilk	Normal/Lognormal	25.4	Student-t
ZINC	10	8	80%	5.80	12.5	7.95	9.52	8.95	3.78	0.476	-0.887	Shapiro-Wilk	Normal	10.1	Student-t

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
NA(1) - Not applicable, there are an insufficient number of samples to calculate statistics.
B qualified data were evaluated as positive detections.

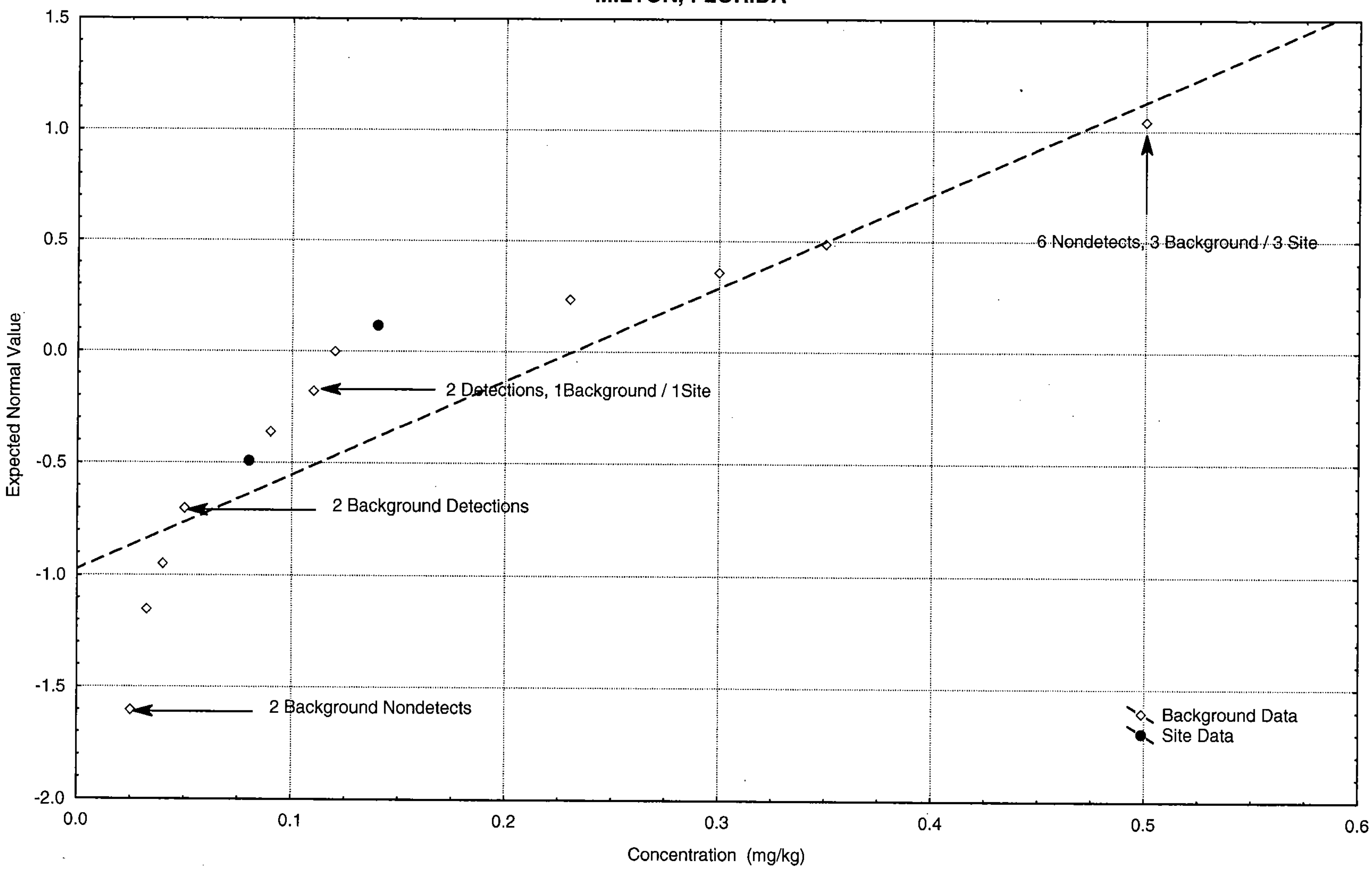
APPENDIX TABLE A-4-8
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 12 SURFACE SOIL																			
MERCURY	3/6	5/15	8/21	62%	**FAIL**	0.04 J	0.07 J	0.0400	0.0355	---	---	---	---	Proportions	-0.940	0.174	NO	PASS	NO
NICKEL	5/6	**6/15**	11/21	48%	**FAIL**	5.2 J	5.9 J	3.20	2.65	---	---	---	---	Proportions	1.05	0.146	NO	PASS	NO
SITE 12 SUBSURFACE SOIL																			
BARIUM	10/10	14/14	24/24	0%	PASS	18.8 J	15.8 J	12.8	7.93	NORMAL	LOGNORMAL	**FAIL**	---	WRS	3.11	0.00188	**YES**	---	**YES**
BERYLLIUM	**4/10**	10/14	14/24	42%	**FAIL**	0.24 J	0.23 J	0.0905	0.101	---	---	---	---	Proportions	1.85	0.0320	**YES**	---	**YES**
COPPER	8/10	14/14	22/24	8%	PASS	7.2	9.6	4.95	4.43	NORMAL	LOGNORMAL	**FAIL**	---	WRS	1.08	0.278	NO	PASS	NO
NICKEL	6/10	7/14	13/24	46%	PASS	3.3 J	4.9 J	1.74	1.70	NORMAL	UNDEFINED	**FAIL**	---	WRS	0.842	0.400	NO	PASS	NO

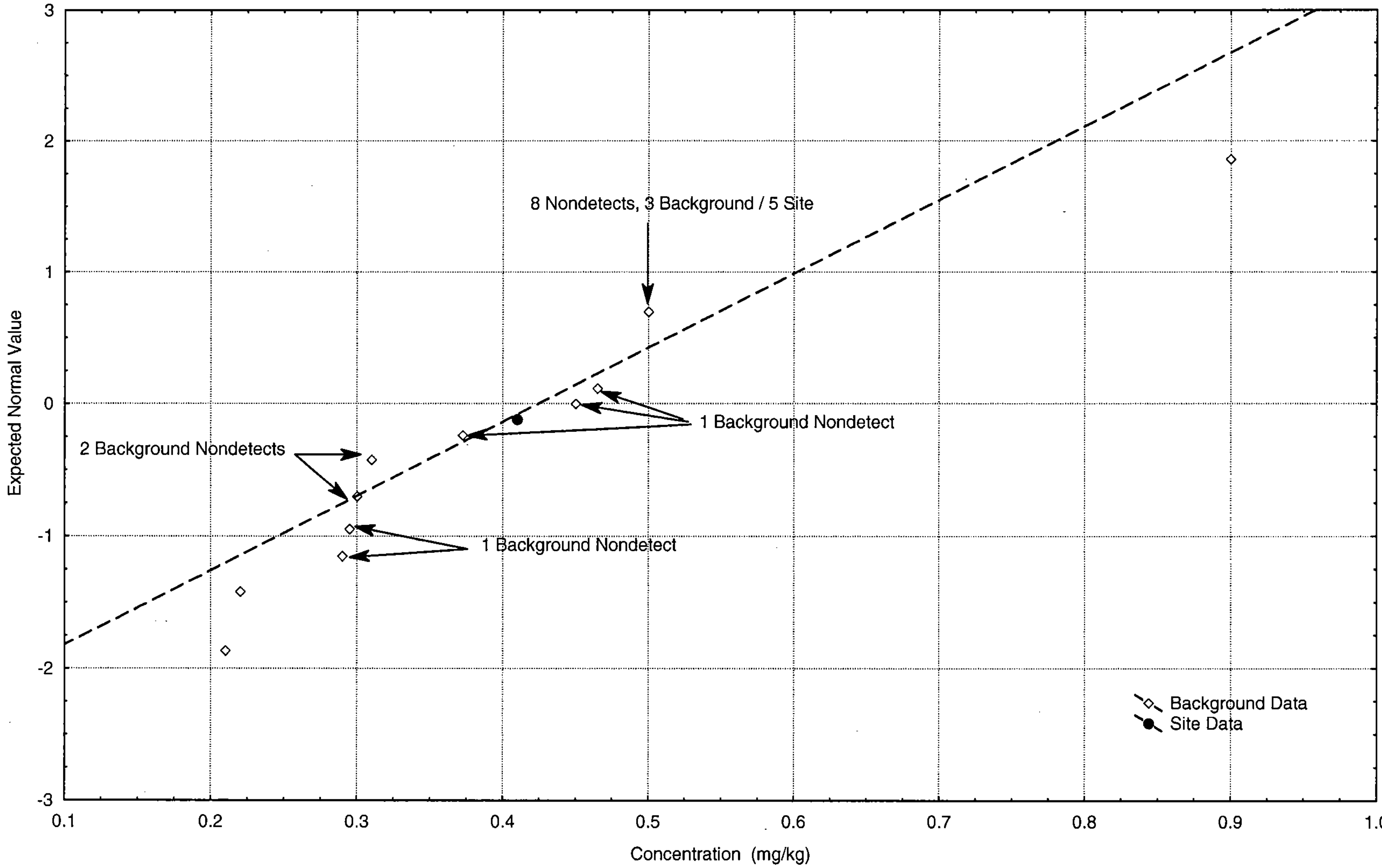
APPENDIX FIGURE A-4-1
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



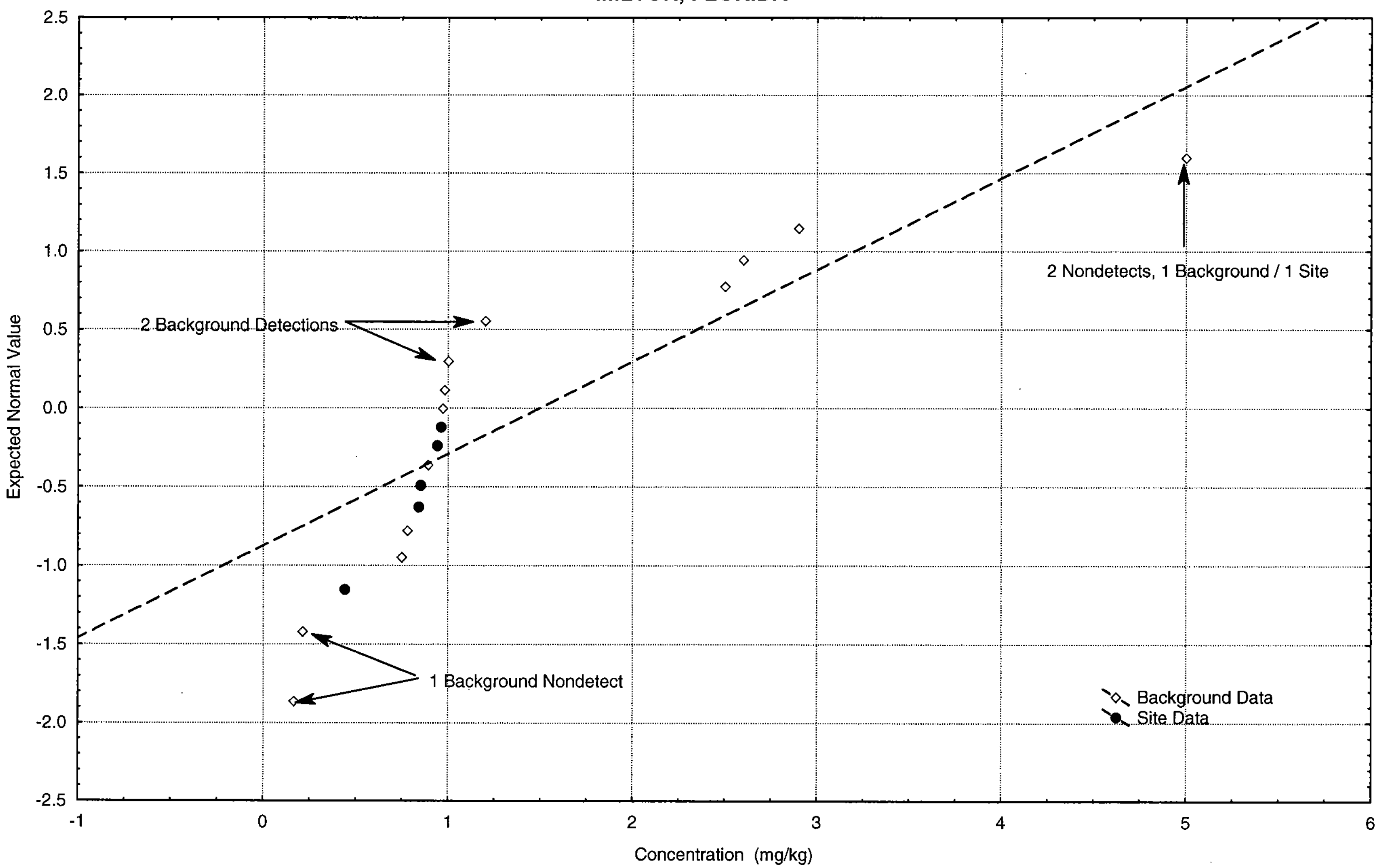
APPENDIX FIGURE A-4-2
NORMAL PROBABILITY PLOT - BERYLLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



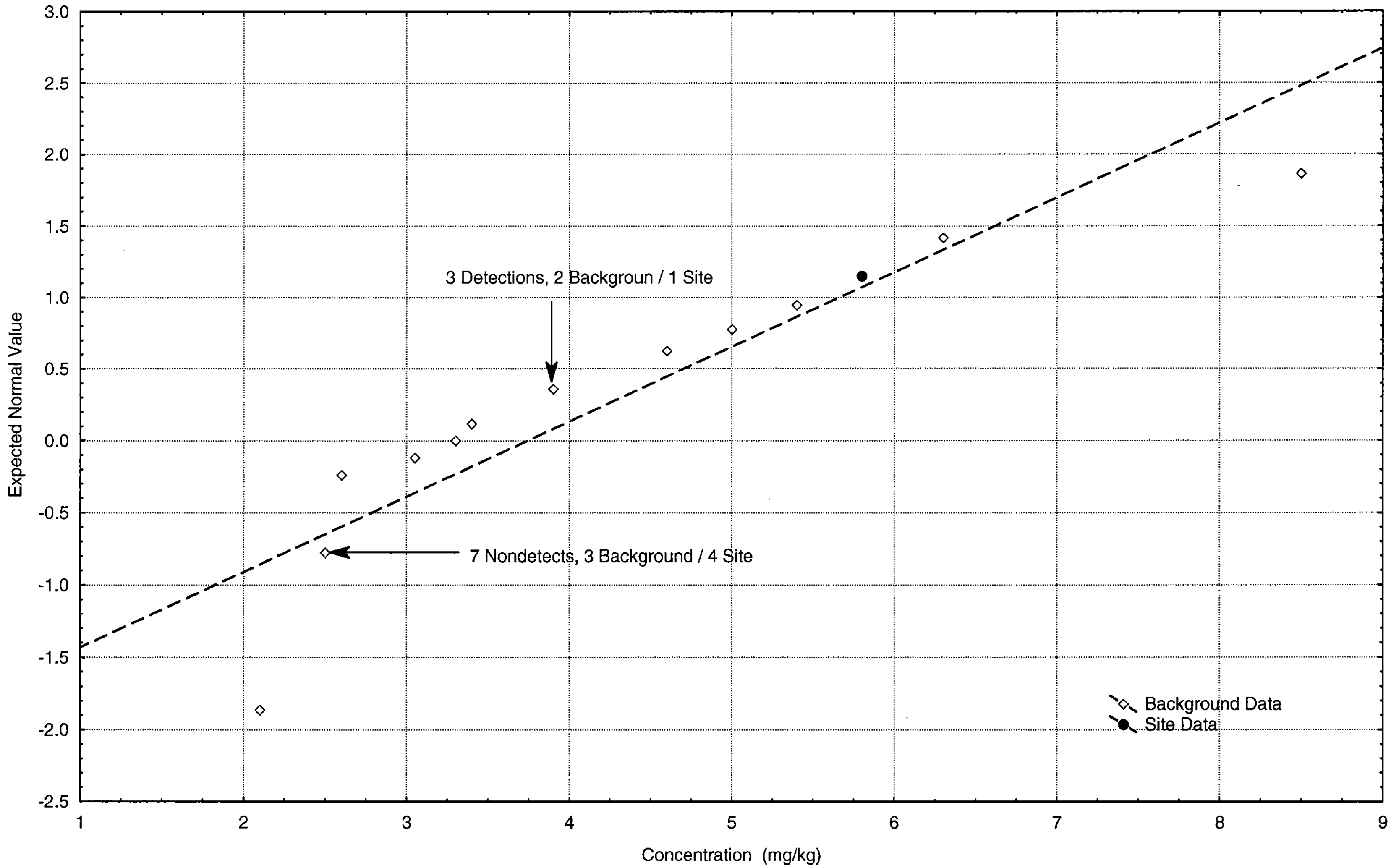
APPENDIX FIGURE A-4-3
NORMAL PROBABILITY PLOT - CADMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



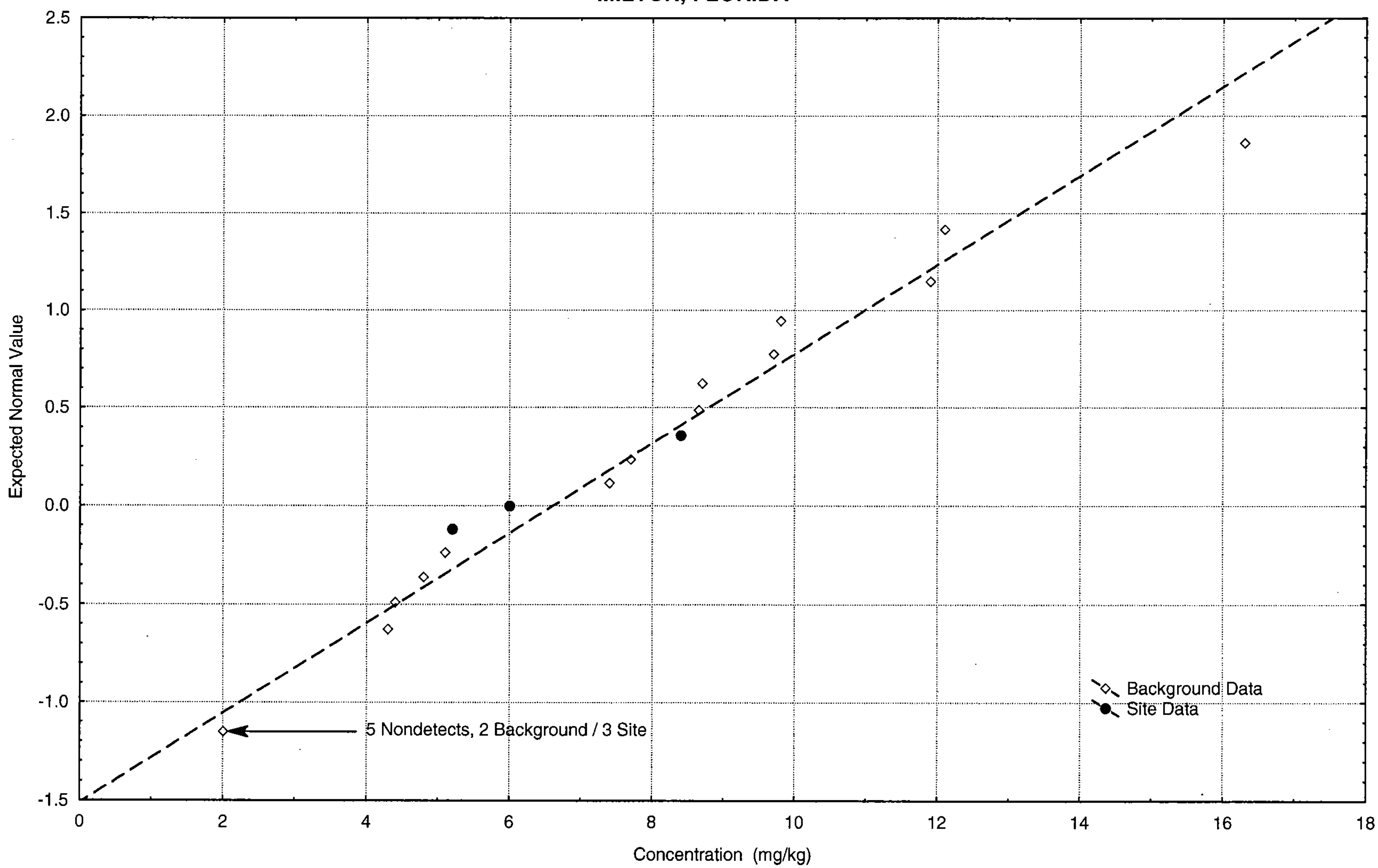
APPENDIX FIGURE A-4-4
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



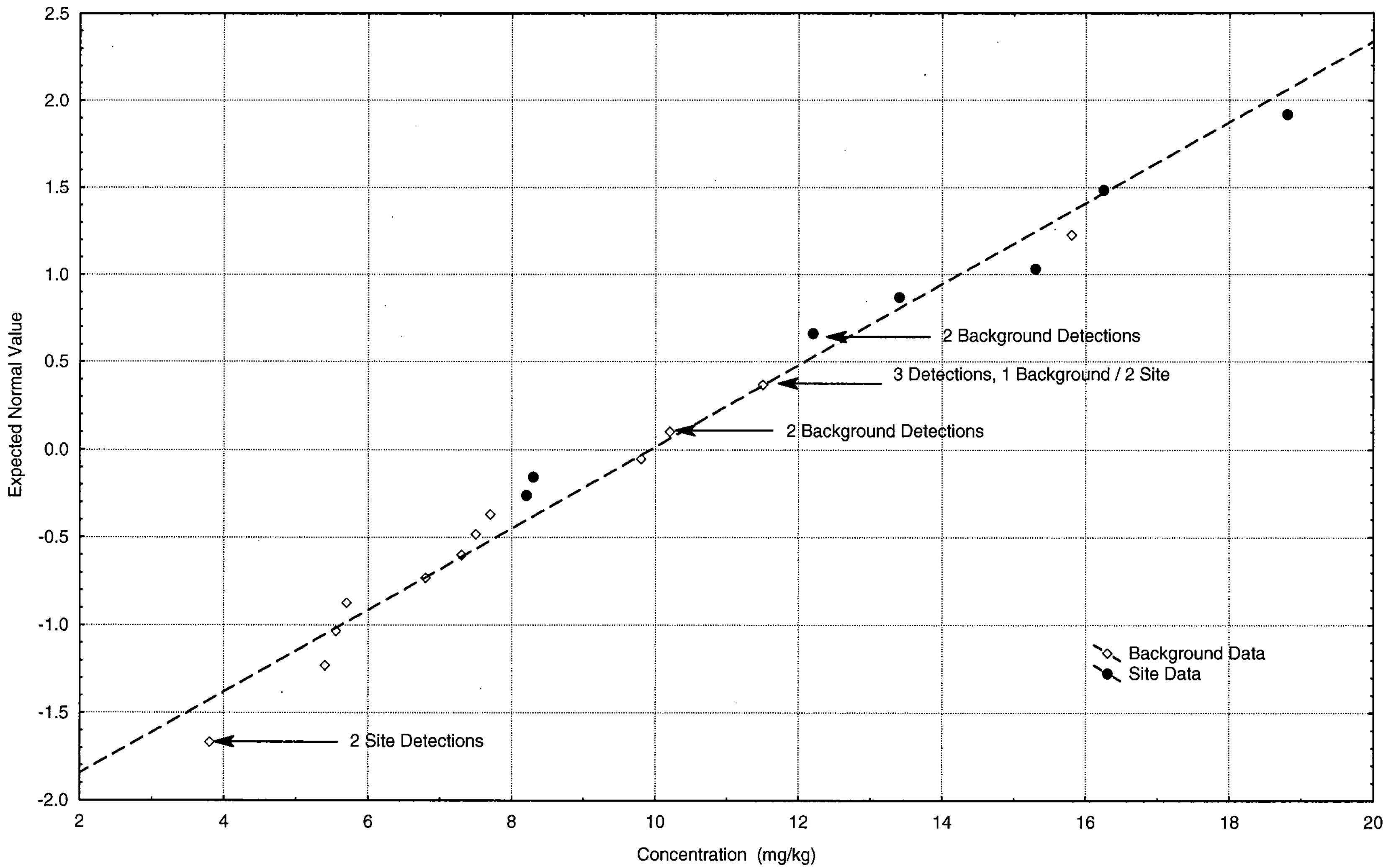
APPENDIX FIGURE A-4-5
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



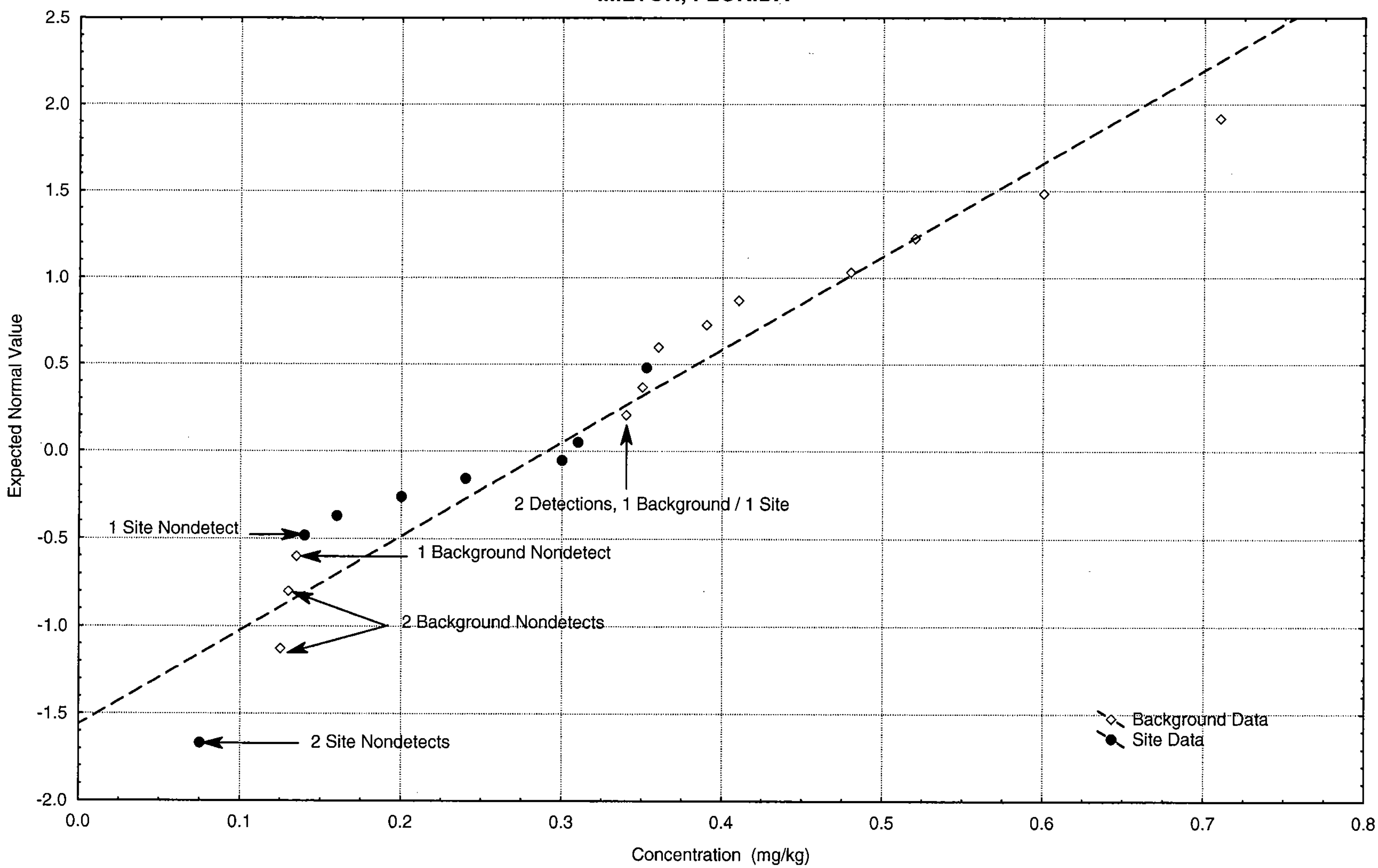
APPENDIX FIGURE A-4-6
NORMAL PROBABILITY PLOT - ZINC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



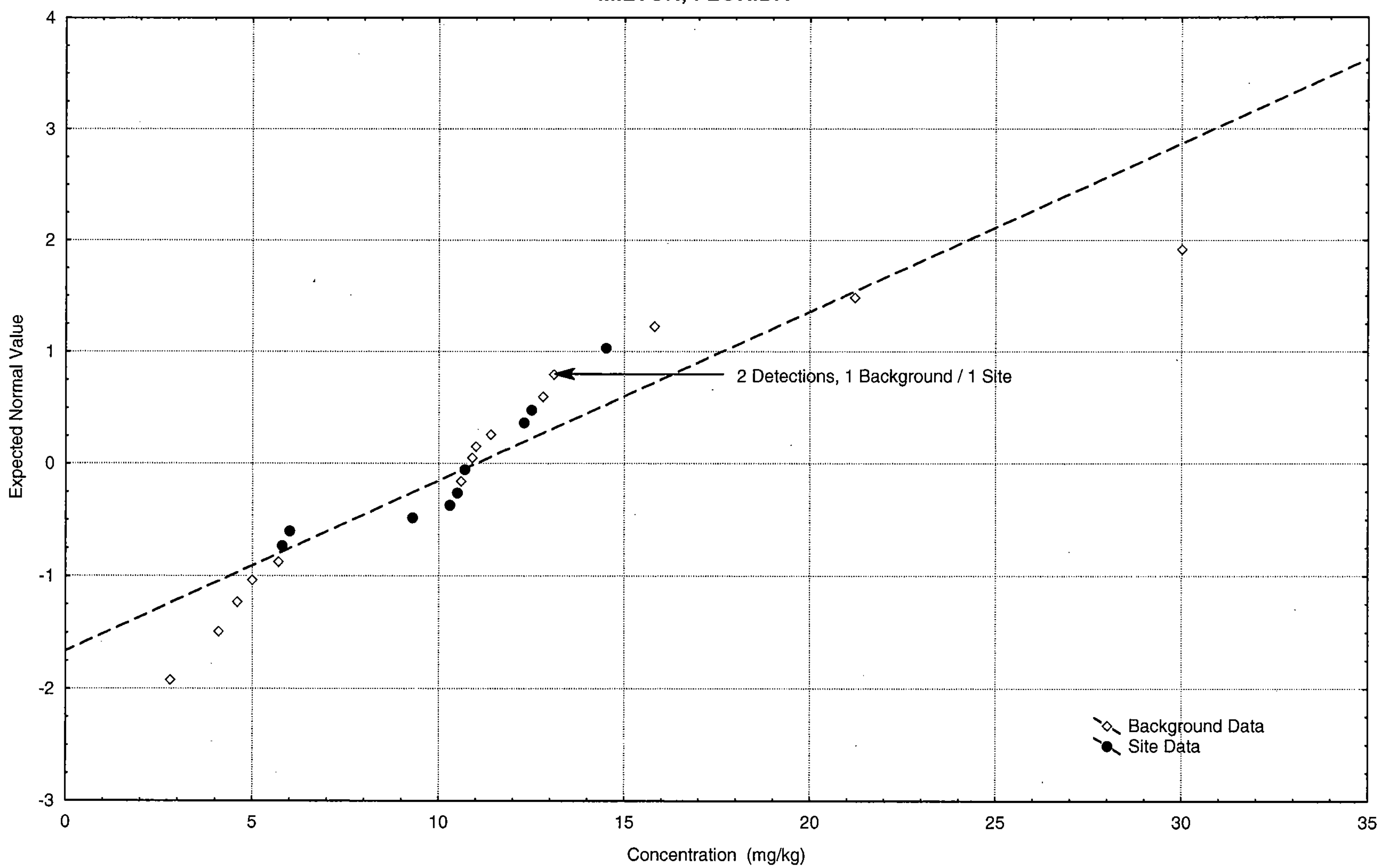
APPENDIX FIGURE A-4-7
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-4-8
NORMAL PROBABILITY PLOT - CADMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-4-9
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.5

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 13 – SANITARY LANDFILL

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05	13-SL-05	13-S001	13-S002	13-S003	13-S004	13-S005
NSAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05-D	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05A	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,1,2-TRICHLOROETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROPROPANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
2-HEXANONE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
ACETONE	11 UJ	11 UJ	11 UJ	11 UJ	12 UJ	12 UJ	12 UJ	11 U	11 U	11 U	19 U	11 U
BENZENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
BROMODICHLOROMETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
BROMOFORM	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
CARBON DISULFIDE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
CARBON TETRACHLORIDE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
CHLOROBENZENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
CHLORODIBROMOMETHANE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
CHLOROFORM	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
ETHYLBENZENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
METHYLENE CHLORIDE	15 UJ	13 UJ	12 UJ	13 UJ	17 UJ	15 UJ	13 UJ	11 U	4 J	4 J	4 J	8 J
STYRENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TETRACHLOROETHENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TOLUENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TOTAL XYLENES	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
TRICHLOROETHENE	5 U	6 U	5 U	6 U	6 U	6 U	6 U	11 U	11 U	11 U	12 U	11 U
VINYL ACETATE	11 U	11 U	11 U	11 U	12 U	12 U	12 U					
VINYL CHLORIDE	11 U	11 U	11 U	11 U	12 U	12 U	12 U	11 U	11 U	11 U	12 U	11 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
1,2-DICHLOROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
1,3-DICHLOROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
1,4-DICHLOROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05	13-SL-05	13-S001	13-S002	13-S003	13-S004	13-S005
NSAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05-D	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05A	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ	920 U	920 U	940 U	960 U	920 U
2,4,6-TRICHLOROPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2,4-DICHLOROPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2,4-DIMETHYLPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2,4-DINITROPHENOL	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ	920 UJ	920 U	940 UJ	960 UJ	920 UJ
2,4-DINITROTOLUENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2,6-DINITROTOLUENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2-CHLORONAPHTHALENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2-CHLOROPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2-METHYLNAPHTHALENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2-METHYLPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
2-NITROANILINE	1800 U	1800 U	1800 U	1800 U	1900 U	1900 U	1900 U	920 U	920 U	940 U	960 U	920 U
2-NITROPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
3,3'-DICHLOROBENZIDINE	730 U	750 U	730 U	760 U	790 UJ	795 UJ	800 UJ	370 U	370 U	370 U	380 U	370 U
3-NITROANILINE	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ	920 U	920 U	940 U	960 U	920 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ	920 UJ	920 U	940 UJ	960 UJ	920 UJ
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
4-CHLOROANILINE	370 U	370 U	370 U	380 UJ	390 UJ	395 UJ	400 UJ	370 U	370 U	370 U	380 U	370 U
4-METHYLPHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
4-NITROANILINE	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ	920 U	920 U	940 U	960 U	920 U
4-NITROPHENOL	1800 U	1800 U	1800 U	1800 U	1900 U	1900 U	1900 U	920 U	920 U	940 U	960 U	920 U
ACENAPHTHENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
ACENAPHTHYLENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
ANTHRACENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BENZO(A)ANTHRACENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BENZO(A)PYRENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BENZO(B)FLUORANTHENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BENZO(G,H,I)PERYLENE	370 U	370 U	370 U	380 UJ	390 UJ	395 UJ	400 UJ	370 U	370 U	370 U	380 U	370 U
BENZO(K)FLUORANTHENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 UJ	370 U	370 UJ	380 UJ	370 UJ
BENZOIC ACID	1800 U	1800 U	1800 U	1800 UJ	1900 UJ	1900 UJ	1900 UJ					
BENZYL ALCOHOL	370 UJ	370 UJ	370 UJ	380 U	390 U	395 U	400 U					
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	95 J	100 J	370 U	450	390 U	64 J	64 J	370 U	370 U	370 U	380 U	370 U
BUTYL BENZYL PHTHALATE	370 U	370 U	370 U	380 UJ	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
CHRYSENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
DI-N-BUTYL PHTHALATE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
DI-N-OCTYL PHTHALATE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	370 U	380 UJ	390 UJ	395 UJ	400 UJ	370 U	370 U	370 U	380 U	370 U

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05	13-SL-05	13-S001	13-S002	13-S003	13-S004	13-S005
NSAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05-D	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05A	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
DIETHYL PHTHALATE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
DIMETHYL PHTHALATE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
FLUORANTHENE	51 J	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
FLUORENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
HEXACHLOROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
HEXACHLOROBUTADIENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
HEXACHLOROCYCLOPENTADIENE	370 UJ	370 UJ	370 UJ	380 UJ	390 UJ	395 UJ	400 UJ	370 U	370 U	370 U	380 U	370 U
HEXACHLOROETHANE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	370 U	380 UJ	390 UJ	395 UJ	400 UJ	370 U	370 U	370 U	380 U	370 U
ISOPHORONE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
N-NITROSODIPHENYLAMINE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
NAPHTHALENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
NITROBENZENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 UJ	370 U	370 UJ	380 UJ	370 UJ
PENTACHLOROPHENOL	1800 U	1800 U	1800 U	1800 U	1900 U	1900 U	1900 U	920 UJ	920 U	940 UJ	960 UJ	920 UJ
PHENANTHRENE	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
PHENOL	370 U	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
PYRENE	61 J	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
Pesticides PCBs (ug/kg)												
4,4'-DDD	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
4,4'-DDE	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
4,4'-DDT	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
ALDRIN	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
ALPHA-BHC	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
ALPHA-CHLORDANE	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
AROCLOR-1016	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	37 U	36 U	37 U	38 U	36 U
AROCLOR-1221	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	74 U	74 U	75 U	77 U	74 U
AROCLOR-1232	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	37 U	36 U	37 U	38 U	36 U
AROCLOR-1242	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	37 U	36 U	37 U	38 U	36 U
AROCLOR-1248	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	37 U	36 U	37 U	38 U	36 U
AROCLOR-1254	180 U	180 U	180 U	180 U	190 U	190 U	190 U	37 U	36 U	37 U	38 U	36 U
AROCLOR-1260	180 U	180 U	180 U	180 U	190 U	190 U	190 U	37 U	36 U	37 U	38 U	36 U
BETA-BHC	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
DELTA-BHC	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
DIELDRIN	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
ENDOSULFAN I	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
ENDOSULFAN II	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
ENDOSULFAN SULFATE	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
ENDRIN	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05	13-SL-05	13-S001	13-S002	13-S003	13-S004	13-S005
NSAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05-D	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05A	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	18 U	18 U	18 U	18 U	19 U	19 U	19 U	3.7 U	3.6 U	3.7 U	3.8 U	3.6 U
GAMMA-BHC (LINDANE)	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
GAMMA-CHLORDANE	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
HEPTACHLOR	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
HEPTACHLOR EPOXIDE	8.9 U	9.1 U	8.9 U	9.2 U	9.5 U	9.55 U	9.6 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
METHOXYCHLOR	89 U	91 U	89 U	92 U	95 U	95.5 U	96 U	19 U	19 U	19 U	20 U	19 U
TOXAPHENE	180 U	180 U	180 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U	190 U
Inorganics (mg/kg)												
ALUMINUM	14100	19300	10900	20900	10500	9285	8070	13200	14800	38300	10200	9430
ANTIMONY	2.7 U	2.8 U	2.7 U	2.9 U	2.9 U	2.9 U	2.9 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	2.9	3.9	3.4	6.9	2.4	2.2 J	2 J	2.6	4	6.4	3.6	1.6 J
BARIUM	9.5 J	7.6 J	5.9 J	9.1 J	7.9 J	7.25 J	6.6 J	26.6 J	7.5 J	14.6 J	9.7 J	11.9 J
BERYLLIUM	0.07 J	0.08 J	0.06 J	0.16 J	0.06 UJ	0.06 UJ	0.06 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	0.6 U	0.61 U	0.61 U	0.64 U	0.65 U	0.645 U	0.64 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	525 J	143 J	350 J	355 J	78.4 J	85.4 J	92.4 J	47.5 J	34.2 J	127 J	121 J	44.7 J
CHROMIUM	11.6	18.6	11	17.7	8.2	7.8	7.4	8.8	14.4	27.9	14.3	6.9
COBALT	0.34 UJ	0.73 J	0.51 J	1.3 J	0.74 J	0.87 J	1 J	1.9 J	0.51 J	1.1 J	0.48 J	0.96 J
COPPER	9.2	5.9	7.6	5.2 J	4	4.1 J	4.2 J	5 UJ	5 UJ	8	5 UJ	5 UJ
IRON	8150	14900	8990	15500	6680	5820	4960	8090	11800	23500	11900	5620
LEAD	5.8	5.8	4.6	10.5	3.2	3.6	4	7 J	5.1 J	8.3 J	6.6 J	4.7 J
MAGNESIUM	172 J	98.9 J	107 J	87.5 J	57.5 J	54.05 J	50.6 J	144 J	88.9 J	203 J	92 J	115 J
MANGANESE	32.8	25.4	18.7	62.1	79.1	78.05	77	407 J	45.1 J	69 J	57.3 J	159 J
MERCURY	0.04 J	0.05 J	0.04 J	0.04 J	0.05 J	0.05 J	0.05 J	0.03 J	0.01 J	0.02 J	0.02 J	0.02 J
NICKEL	2.4 U	2.8 J	2.4 U	2.5 U	2.5 U	2.075 J	2.9 J	4.3 J	3.9 J	6.7 J	2.9 J	3.3 J
POTASSIUM	132 U	135 U	133 U	140 U	143 U	142 U	141 U	1000 U	1000 U	150 J	1000 U	1000 U
SELENIUM	0.46 U	0.47 U	0.46 U	0.48 U	0.5 U	0.495 U	0.49 U	1 UJ	1 UJ	0.27 J	1 UJ	1 UJ
SILVER	0.74 J	0.76 J	0.39 J	1.2 J	0.48 J	0.42 J	0.36 J	2 U	2 U	2 U	2 U	2 U
SODIUM	181 J	202 J	173 J	193 J	176 J	219 J	262 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
THALLIUM	0.35 U	0.35 U	0.35 U	0.37 U	0.38 U	0.375 U	0.37 U	2 U	2 U	2 U	2 UJ	2 U
VANADIUM	23.1	41.3	26.5	42	17.5	15.3	13.1	19.8	32.4	62.4	31.8	14.5
ZINC	13.2	8.2 J	7.8 J	10.8 J	17.5	16.8	16.1	4 U	4 UJ	4 U	4 U	4 U
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.24 U	0.25 U	0.24 U	0.25 U	0.26 U	0.26 U	0.26 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO06	13SO07	13SO08	13SO09	13SO10	13SO11	13SO12	13SO13	13SO14	13SO15	13SO15	13SO15
NSAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE												
1,1,2,2-TETRACHLOROETHANE												
1,1,2-TRICHLOROETHANE												
1,1-DICHLOROETHANE												
1,1-DICHLOROETHENE												
1,2-DICHLOROETHANE												
1,2-DICHLOROPROPANE												
2-BUTANONE												
2-HEXANONE												
4-METHYL-2-PENTANONE												
ACETONE												
BENZENE												
BROMODICHLOROMETHANE												
BROMOFORM												
BROMOMETHANE												
CARBON DISULFIDE												
CARBON TETRACHLORIDE												
CHLOROBENZENE												
CHLORODIBROMOMETHANE												
CHLOROETHANE												
CHLOROFORM												
CHLOROMETHANE												
CIS-1,3-DICHLOROPROPENE												
ETHYLBENZENE												
METHYLENE CHLORIDE												
STYRENE												
TETRACHLOROETHENE												
TOLUENE												
TOTAL 1,2-DICHLOROETHENE												
TOTAL XYLENES												
TRANS-1,3-DICHLOROPROPENE												
TRICHLOROETHENE												
VINYL ACETATE												
VINYL CHLORIDE												
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE												
1,2-DICHLOROBENZENE												
1,3-DICHLOROBENZENE												
1,4-DICHLOROBENZENE												

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SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO06	13SO07	13SO08	13SO09	13SO10	13SO11	13SO12	13SO13	13SO14	13SO15	13SO15	13SO15
NSAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL												
2,4,6-TRICHLOROPHENOL												
2,4-DICHLOROPHENOL												
2,4-DIMETHYLPHENOL												
2,4-DINITROPHENOL												
2,4-DINITROTOLUENE												
2,6-DINITROTOLUENE												
2-CHLORONAPHTHALENE												
2-CHLOROPHENOL												
2-METHYLNAPHTHALENE												
2-METHYLPHENOL												
2-NITROANILINE												
2-NITROPHENOL												
3,3'-DICHLOROBENZIDINE												
3-NITROANILINE												
4,6-DINITRO-2-METHYLPHENOL												
4-BROMOPHENYL PHENYL ETHER												
4-CHLORO-3-METHYLPHENOL												
4-CHLOROANILINE												
4-METHYLPHENOL												
4-NITROANILINE												
4-NITROPHENOL												
ACENAPHTHENE												
ACENAPHTHYLENE												
ANTHRACENE												
BENZO(A)ANTHRACENE												
BENZO(A)PYRENE												
BENZO(B)FLUORANTHENE												
BENZO(G,H,I)PERYLENE												
BENZO(K)FLUORANTHENE												
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE												
BIS(2-CHLOROETHYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE												
BUTYL BENZYL PHTHALATE												
CHRYSENE												
DI-N-BUTYL PHTHALATE												
DI-N-OCTYL PHTHALATE												
DIBENZO(A,H)ANTHRACENE												

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO06	13SO07	13SO08	13SO09	13SO10	13SO11	13SO12	13SO13	13SO14	13SO15	13SO15	13SO15
NSAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN												
DIETHYL PHTHALATE												
DIMETHYL PHTHALATE												
FLUORANTHENE												
FLUORENE												
HEXACHLOROBENZENE												
HEXACHLOROBUTADIENE												
HEXACHLOROCYCLOPENTADIENE												
HEXACHLOROETHANE												
INDENO(1,2,3-CD)PYRENE												
ISOPHORONE												
N-NITROSO-DI-N-PROPYLAMINE												
N-NITROSODIPHENYLAMINE												
NAPHTHALENE												
NITROBENZENE												
PENTACHLOROPHENOL												
PHENANTHRENE												
PHENOL												
PYRENE												
Pesticides PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-BHC												
ALPHA-CHLORDANE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC												
DELTA-BHC												
DIELDRIN												
ENDOSULFAN I												
ENDOSULFAN II												
ENDOSULFAN SULFATE												
ENDRIN												

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO06	13SO07	13SO08	13SO09	13SO10	13SO11	13SO12	13SO13	13SO14	13SO15	13SO15	13SO15
NSAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE												
GAMMA-BHC (LINDANE)												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
METHOXYCHLOR												
TOXAPHENE												
Inorganics (mg/kg)												
ALUMINUM												
ANTIMONY												
ARSENIC	4.3	7.2	6.4	4.8	5.3	5.1	5.3	5.4	6.5	4.4	4.1	3.8
BARIUM												
BERYLLIUM												
CADMIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD												
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
THALLIUM												
VANADIUM												
ZINC												
Miscellaneous Parameters (mg/kg)												
CYANIDE												

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO16	13SO17	13SO18	13SO19	13SO20	13SO27	13SO28	13SO31	13SO32	13SO32	13SO32
NSAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE											
1,1,2,2-TETRACHLOROETHANE											
1,1,2-TRICHLOROETHANE											
1,1-DICHLOROETHANE											
1,1-DICHLOROETHENE											
1,2-DICHLOROETHANE											
1,2-DICHLOROPROPANE											
2-BUTANONE											
2-HEXANONE											
4-METHYL-2-PENTANONE											
ACETONE											
BENZENE											
BROMODICHLOROMETHANE											
BROMOFORM											
BROMOMETHANE											
CARBON DISULFIDE											
CARBON TETRACHLORIDE											
CHLOROBENZENE											
CHLORODIBROMOMETHANE											
CHLOROETHANE											
CHLOROFORM											
CHLOROMETHANE											
CIS-1,3-DICHLOROPROPENE											
ETHYLBENZENE											
METHYLENE CHLORIDE											
STYRENE											
TETRACHLOROETHENE											
TOLUENE											
TOTAL 1,2-DICHLOROETHENE											
TOTAL XYLENES											
TRANS-1,3-DICHLOROPROPENE											
TRICHLOROETHENE											
VINYL ACETATE											
VINYL CHLORIDE											
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE											
1,2-DICHLOROBENZENE											
1,3-DICHLOROBENZENE											
1,4-DICHLOROBENZENE											

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO16	13SO17	13SO18	13SO19	13SO20	13SO27	13SO28	13SO31	13SO32	13SO32	13SO32
NSAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL											
2,4,6-TRICHLOROPHENOL											
2,4-DICHLOROPHENOL											
2,4-DIMETHYLPHENOL											
2,4-DINITROPHENOL											
2,4-DINITROTOLUENE											
2,6-DINITROTOLUENE											
2-CHLORONAPHTHALENE											
2-CHLOROPHENOL											
2-METHYLNAPHTHALENE											
2-METHYLPHENOL											
2-NITROANILINE											
2-NITROPHENOL											
3,3'-DICHLOROBENZIDINE											
3-NITROANILINE											
4,6-DINITRO-2-METHYLPHENOL											
4-BROMOPHENYL PHENYL ETHER											
4-CHLORO-3-METHYLPHENOL											
4-CHLOROANILINE											
4-METHYLPHENOL											
4-NITROANILINE											
4-NITROPHENOL											
ACENAPHTHENE											
ACENAPHTHYLENE											
ANTHRACENE											
BENZO(A)ANTHRACENE											
BENZO(A)PYRENE											
BENZO(B)FLUORANTHENE											
BENZO(G,H,I)PERYLENE											
BENZO(K)FLUORANTHENE											
BENZOIC ACID											
BENZYL ALCOHOL											
BIS(2-CHLOROETHOXY)METHANE											
BIS(2-CHLOROETHYL)ETHER											
BIS(2-ETHYLHEXYL)PHTHALATE											
BUTYL BENZYL PHTHALATE											
CHRYSENE											
DI-N-BUTYL PHTHALATE											
DI-N-OCTYL PHTHALATE											
DIBENZO(A,H)ANTHRACENE											

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO16	13SO17	13SO18	13SO19	13SO20	13SO27	13SO28	13SO31	13SO32	13SO32	13SO32
NSAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN											
DIETHYL PHTHALATE											
DIMETHYL PHTHALATE											
FLUORANTHENE											
FLUORENE											
HEXACHLOROBENZENE											
HEXACHLOROBUTADIENE											
HEXACHLOROCYCLOPENTADIENE											
HEXACHLOROETHANE											
INDENO(1,2,3-CD)PYRENE											
ISOPHORONE											
N-NITROSO-DI-N-PROPYLAMINE											
N-NITROSODIPHENYLAMINE											
NAPHTHALENE											
NITROBENZENE											
PENTACHLOROPHENOL											
PHENANTHRENE											
PHENOL											
PYRENE											
Pesticides PCBs (ug/kg)											
4,4'-DDD											
4,4'-DDE											
4,4'-DDT											
ALDRIN											
ALPHA-BHC											
ALPHA-CHLORDANE											
AROCLOR-1016											
AROCLOR-1221											
AROCLOR-1232											
AROCLOR-1242											
AROCLOR-1248											
AROCLOR-1254											
AROCLOR-1260											
BETA-BHC											
DELTA-BHC											
DIELDRIN											
ENDOSULFAN I											
ENDOSULFAN II											
ENDOSULFAN SULFATE											
ENDRIN											

APPENDIX TABLE A-5-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO16	13SO17	13SO18	13SO19	13SO20	13SO27	13SO28	13SO31	13SO32	13SO32	13SO32
NSAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE											
GAMMA-BHC (LINDANE)											
GAMMA-CHLORDANE											
HEPTACHLOR											
HEPTACHLOR EPOXIDE											
METHOXYCHLOR											
TOXAPHENE											
Inorganics (mg/kg)											
ALUMINUM											
ANTIMONY											
ARSENIC	5.9	5.8	5.2	5.4	4.3	4.1	3.4	4.5	4.1	4.1	4.1
BARIUM											
BERYLLIUM											
CADMIUM											
CALCIUM											
CHROMIUM											
COBALT											
COPPER											
IRON											
LEAD											
MAGNESIUM											
MANGANESE											
MERCURY											
NICKEL											
POTASSIUM											
SELENIUM											
SILVER											
SODIUM											
THALLIUM											
VANADIUM											
ZINC											
Miscellaneous Parameters (mg/kg)											
CYANIDE											

APPENDIX TABLE A-5-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013
LOCATION	TP-13-02	TP-13-03	TP-13-05	TP-13-05	TP-13-05
NSAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503-D
SAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503A
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 6	8 - 10	8 - 9	8 - 9	8 - 9
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/6/1992	10/6/1992	10/6/1992	10/6/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
1,1,2,2-TETRACHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
1,1,2-TRICHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
1,1-DICHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
1,1-DICHLOROETHENE	13 U	11 U	56 U	43.5 U	31 U
1,2-DICHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
1,2-DICHLOROPROPANE	13 U	11 U	56 U	43.5 U	31 U
2-BUTANONE	13 U	11 U	270	270	270
2-HEXANONE	13 U	3 J	56 U	19 J	19 J
4-METHYL-2-PENTANONE	13 U	11 U	27 J	30.5 J	34
ACETONE	86 J	67 J	700 J	640 J	580 J
BENZENE	13 U	11 U	56 U	43.5 U	31 U
BROMODICHLOROMETHANE	13 U	11 U	56 U	43.5 U	31 U
BROMOFORM	13 U	11 U	56 U	43.5 U	31 U
BROMOMETHANE	13 U	11 U	56 U	43.5 U	31 U
CARBON DISULFIDE	13 U	2 J	56 U	43.5 U	31 U
CARBON TETRACHLORIDE	13 U	11 U	56 U	43.5 U	31 U
CHLOROBENZENE	13 U	11 U	56 U	43.5 U	31 U
CHLORODIBROMOMETHANE	13 U	11 U	56 U	43.5 U	31 U
CHLOROETHANE	13 U	11 U	56 U	43.5 U	31 U
CHLOROFORM	13 U	11 U	56 U	43.5 U	31 U
CHLOROMETHANE	13 U	11 U	56 U	43.5 U	31 U
CIS-1,3-DICHLOROPROPENE	13 U	11 U	56 U	43.5 U	31 U
ETHYLBENZENE	13 U	11 U	56 U	43.5 U	31 U
METHYLENE CHLORIDE	13 UJ	11 UJ	56 UJ	43.5 UJ	31 UJ
STYRENE	13 U	11 U	56 U	43.5 U	31 U
TETRACHLOROETHENE	13 U	11 U	56 U	43.5 U	31 U
TOLUENE	13 U	11 U	56 U	10 J	10 J
TOTAL 1,2-DICHLOROETHENE	13 U	11 U	56 U	43.5 U	31 U
TOTAL XYLENES	2 J	2 J	56 U	12 J	12 J
TRANS-1,3-DICHLOROPROPENE	13 U	11 U	56 U	43.5 U	31 U
TRICHLOROETHENE	13 U	11 U	56 U	43.5 U	31 U
VINYL CHLORIDE	13 U	11 U	56 U	43.5 U	31 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	430 U	380 U	370 U	390 U	410 U
1,2-DICHLOROBENZENE	430 U	380 U	370 U	390 U	410 U
1,3-DICHLOROBENZENE	430 U	380 U	370 U	390 U	410 U
1,4-DICHLOROBENZENE	430 U	380 U	370 U	390 U	410 U
2,4,5-TRICHLOROPHENOL	1000 U	920 U	900 U	950 U	1000 U

APPENDIX TABLE A-5-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013
LOCATION	TP-13-02	TP-13-03	TP-13-05	TP-13-05	TP-13-05
NSAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503-D
SAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503A
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 6	8 - 10	8 - 9	8 - 9	8 - 9
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/6/1992	10/6/1992	10/6/1992	10/6/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	430 U	380 U	370 U	390 U	410 U
2,4-DICHLOROPHENOL	430 U	380 U	370 U	390 U	410 U
2,4-DIMETHYLPHENOL	430 U	380 U	370 U	390 U	410 U
2,4-DINITROPHENOL	1000 UJ	920 UJ	900 UJ	950 UJ	1000 UJ
2,4-DINITROTOLUENE	430 UJ	380 UJ	370 UJ	390 UJ	410 UJ
2,6-DINITROTOLUENE	430 UJ	380 UJ	370 UJ	390 UJ	410 UJ
2-CHLORONAPHTHALENE	430 U	380 U	370 U	390 U	410 U
2-CHLOROPHENOL	430 U	380 U	370 U	390 U	410 U
2-METHYLNAPHTHALENE	430 U	380 U	370 U	390 U	410 U
2-METHYLPHENOL	430 U	380 U	370 U	390 U	410 U
2-NITROANILINE	1000 U	920 U	900 U	950 U	1000 U
2-NITROPHENOL	430 U	380 U	370 U	390 U	410 U
3,3'-DICHLOROBENZIDINE	430 U	380 U	370 U	390 U	410 U
3-NITROANILINE	1000 U	920 U	900 U	950 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	920 U	900 U	950 U	1000 U
4-BROMOPHENYL PHENYL ETHER	430 U	380 U	370 U	390 U	410 U
4-CHLORO-3-METHYLPHENOL	430 U	380 U	370 U	390 U	410 U
4-CHLOROANILINE	430 U	380 U	370 U	390 U	410 U
4-METHYLPHENOL	430 U	68 J	1200	1095	990
4-NITROANILINE	1000 U	920 U	900 U	950 U	1000 U
4-NITROPHENOL	1000 U	920 U	900 U	950 U	1000 U
ACENAPHTHENE	430 U	380 U	370 U	390 U	410 U
ACENAPHTHYLENE	430 U	380 U	370 U	390 U	410 U
ANTHRACENE	430 U	380 U	370 U	390 U	410 U
BENZO(A)ANTHRACENE	430 U	380 U	370 U	390 U	410 U
BENZO(A)PYRENE	430 U	380 U	370 U	390 U	410 U
BENZO(B)FLUORANTHENE	430 U	380 U	370 U	390 U	410 U
BENZO(G,H,I)PERYLENE	430 U	380 U	370 U	390 U	410 U
BENZO(K)FLUORANTHENE	430 UJ	380 UJ	370 UJ	390 UJ	410 UJ
BIS(2-CHLOROETHOXY)METHANE	430 U	380 U	370 U	390 U	410 U
BIS(2-CHLOROETHYL)ETHER	430 U	380 U	370 U	390 U	410 U
BIS(2-ETHYLHEXYL)PHTHALATE	430 UJ	430 UJ	410 J	307.5 J	410 UJ
BUTYL BENZYL PHTHALATE	430 U	380 U	370 U	390 U	410 U
CHRYSENE	430 U	380 U	370 U	390 U	410 U
DI-N-BUTYL PHTHALATE	430 UJ	380 U	370 UJ	390 UJ	410 UJ
DI-N-OCTYL PHTHALATE	430 U	380 U	370 U	390 U	410 U
DIBENZO(A,H)ANTHRACENE	430 U	380 U	370 U	390 U	410 U
DIBENZOFURAN	430 U	380 U	370 U	390 U	410 U
DIETHYL PHTHALATE	430 U	380 U	140 J	119.5 J	99 J
DIMETHYL PHTHALATE	430 U	380 U	370 U	390 U	410 U

APPENDIX TABLE A-5-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013
LOCATION	TP-13-02	TP-13-03	TP-13-05	TP-13-05	TP-13-05
NSAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503-D
SAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503A
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 6	8 - 10	8 - 9	8 - 9	8 - 9
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/6/1992	10/6/1992	10/6/1992	10/6/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	430 U	380 U	370 U	390 U	410 U
FLUORENE	430 U	380 U	370 U	390 U	410 U
HEXACHLOROBENZENE	430 U	380 U	370 U	390 U	410 U
HEXACHLOROBUTADIENE	430 U	380 U	370 U	390 U	410 U
HEXACHLOROCYCLOPENTADIENE	430 U	380 U	370 U	390 U	410 U
HEXACHLOROETHANE	430 U	380 U	370 U	390 U	410 U
INDENO(1,2,3-CD)PYRENE	430 U	380 U	370 U	390 U	410 U
ISOPHORONE	430 UJ	380 UJ	370 UJ	390 UJ	410 UJ
N-NITROSO-DI-N-PROPYLAMINE	430 U	380 U	370 U	390 U	410 U
N-NITROSODIPHENYLAMINE	430 U	380 U	370 U	390 U	410 U
NAPHTHALENE	430 U	380 U	510	325 J	140 J
NITROBENZENE	430 UJ	380 UJ	370 UJ	390 UJ	410 UJ
PENTACHLOROPHENOL	1000 U	920 U	900 U	950 U	1000 U
PHENANTHRENE	430 U	380 U	370 U	390 U	410 U
PHENOL	430 U	380 U	130 J	130 J	130 J
PYRENE	430 U	380 U	370 U	390 U	410 U
Pesticides PCBs (ug/kg)					
4,4'-DDD	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
4,4'-DDE	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
4,4'-DDT	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
ALDRIN	2.2 U	2 U	1.9 U	2 U	2.1 U
ALPHA-BHC	2.2 U	2 U	1.9 U	2 U	2.1 U
ALPHA-CHLORDANE	2.2 U	2 U	1.9 U	2 U	2.1 U
AROCLOR-1016	43 U	38 U	37 U	39 U	41 U
AROCLOR-1221	87 U	77 U	75 U	79.5 U	84 U
AROCLOR-1232	43 U	38 U	37 U	39 U	41 U
AROCLOR-1242	43 U	38 U	37 U	39 U	41 U
AROCLOR-1248	43 U	38 U	37 U	39 U	41 U
AROCLOR-1254	43 U	38 U	37 U	39 U	41 U
AROCLOR-1260	43 U	38 U	37 U	39 U	41 U
BETA-BHC	2.2 U	2 U	1.9 U	2 U	2.1 U
DELTA-BHC	2.2 U	2 U	1.9 U	2 U	2.1 U
DIELDRIN	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
ENDOSULFAN I	2.2 U	2 U	1.9 U	2 U	2.1 U
ENDOSULFAN II	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
ENDOSULFAN SULFATE	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
ENDRIN	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
ENDRIN KETONE	4.3 U	3.8 U	3.7 U	3.9 U	4.1 U
GAMMA-BHC (LINDANE)	2.2 U	2 U	1.9 U	2 U	2.1 U
GAMMA-CHLORDANE	2.2 U	2 U	1.9 U	2 U	2.1 U

APPENDIX TABLE A-5-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013
LOCATION	TP-13-02	TP-13-03	TP-13-05	TP-13-05	TP-13-05
NSAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503-D
SAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503A
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 6	8 - 10	8 - 9	8 - 9	8 - 9
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/6/1992	10/6/1992	10/6/1992	10/6/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	2.2 U	2 U	1.9 U	2 U	2.1 U
HEPTACHLOR EPOXIDE	2.2 U	2 U	1.9 U	2 U	2.1 U
METHOXYCHLOR	22 U	20 U	19 U	20 U	21 U
TOXAPHENE	220 U	200 U	190 U	200 U	210 U
Inorganics (mg/kg)					
ALUMINUM	23900	10700	14800	13150	11500
ANTIMONY	2.9 U	2.8 U	3.7 J	2.575 J	2.9 U
ARSENIC	6.5	4.7	4.1	3.75	3.4
BARIUM	7.5 J	6.3 J	7.1 J	7.05 J	7 J
BERYLLIUM	0.2 J	0.16 J	0.17 J	0.165 J	0.16 J
CADMIUM	0.69 U	0.67 U	0.63 U	0.635 U	0.64 U
CALCIUM	130 J	151 J	192 J	193 J	194 J
CHROMIUM	21	15.9	17.3	16.75	16.2
COBALT	1.4 J	0.75 J	1.3 J	0.965 J	0.63 J
COPPER	5.8 J	3.9 J	5 J	5.15 J	5.3 J
IRON	16200	13500	15600	13900	12200
LEAD	6	5.8	4.7	5.1	5.5
MAGNESIUM	97.7 J	73.2 J	74.8 J	73.85 J	72.9 J
MANGANESE	41.6	21.7	22.5	18.8	15.1
MERCURY	0.2 J	0.16 J	4.2	2.14 J	0.08 J
NICKEL	2.1 J	1.2 U	2.5 U	2.5 U	2.5 U
POTASSIUM	158 U	154 U	180 J	125 J	140 U
SELENIUM	0.49 U	0.48 U	0.48 U	0.485 U	0.49 U
SILVER	0.53 J	0.5 J	0.62 J	0.57 J	0.52 J
SODIUM	206 J	211 J	206 J	200.5 J	195 J
THALLIUM	0.37 U	0.36 U	0.37 U	0.37 U	0.37 U
VANADIUM	44.6	38.2	40.1	37.5	34.9
ZINC	10.2	6	7.3	7.05	6.8
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.1 U	0.1 U	0.1 U	0.085 J	0.12 J

APPENDIX TABLE A-5-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05	13-SL-05	13-S001	13-S002	13-S003	13-S004	13-S005
NSAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05-D	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SAMPLE	13-SL-01	13-SL-02	13-SL-03	13-SL-04	13-SL-05	13-SL-05-AVG	13-SL-05A	13SO0101	13SO0201	13SO0301	13SO0401	13SO0501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	8/18/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
METHYLENE CHLORIDE	15 UJ	13 UJ	12 UJ	13 UJ	17 UJ	15 UJ	13 UJ	11 U	4 J	4 J	4 J	8 J
Semivolatile Organics (ug/kg)												
BIS(2-ETHYLHEXYL)PHTHALATE	95 J	100 J	370 U	450	390 U	64 J	64 J	370 U	370 U	370 U	380 U	370 U
FLUORANTHENE	51 J	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
PYRENE	61 J	370 U	370 U	380 U	390 U	395 U	400 U	370 U	370 U	370 U	380 U	370 U
Inorganics (mg/kg)												
ALUMINUM	14100	19300	10900	20900	10500	9285	8070	13200	14800	38300	10200	9430
ARSENIC	2.9	3.9	3.4	6.9	2.4	2.2 J	2 J	2.6	4	6.4	3.6	1.6 J
BARIUM	9.5 J	7.6 J	5.9 J	9.1 J	7.9 J	7.25 J	6.6 J	26.6 J	7.5 J	14.6 J	9.7 J	11.9 J
BERYLLIUM	0.07 J	0.08 J	0.06 J	0.16 J	0.06 UJ	0.06 UJ	0.06 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CALCIUM	525 J	143 J	350 J	355 J	78.4 J	85.4 J	92.4 J	47.5 J	34.2 J	127 J	121 J	44.7 J
CHROMIUM	11.6	18.6	11	17.7	8.2	7.8	7.4	8.8	14.4	27.9	14.3	6.9
COBALT	0.34 UJ	0.73 J	0.51 J	1.3 J	0.74 J	0.87 J	1 J	1.9 J	0.51 J	1.1 J	0.48 J	0.96 J
COPPER	9.2	5.9	7.6	5.2 J	4	4.1 J	4.2 J	5 UJ	5 UJ	8	5 UJ	5 UJ
IRON	8150	14900	8990	15500	6680	5820	4960	8090	11800	23500	11900	5620
LEAD	5.8	5.8	4.6	10.5	3.2	3.6	4	7 J	5.1 J	8.3 J	6.6 J	4.7 J
MAGNESIUM	172 J	98.9 J	107 J	87.5 J	57.5 J	54.05 J	50.6 J	144 J	88.9 J	203 J	92 J	115 J
MANGANESE	32.8	25.4	18.7	62.1	79.1	78.05	77	407 J	45.1 J	69 J	57.3 J	159 J
MERCURY	0.04 J	0.05 J	0.04 J	0.04 J	0.05 J	0.05 J	0.05 J	0.03 J	0.01 J	0.02 J	0.02 J	0.02 J
NICKEL	2.4 U	2.8 J	2.4 U	2.5 U	2.5 U	2.075 J	2.9 J	4.3 J	3.9 J	6.7 J	2.9 J	3.3 J
POTASSIUM	132 U	135 U	133 U	140 U	143 U	142 U	141 U	1000 U	1000 U	150 J	1000 U	1000 U
SELENIUM	0.46 U	0.47 U	0.46 U	0.48 U	0.5 U	0.495 U	0.49 U	1 UJ	1 UJ	0.27 J	1 UJ	1 UJ
SILVER	0.74 J	0.76 J	0.39 J	1.2 J	0.48 J	0.42 J	0.36 J	2 U	2 U	2 U	2 U	2 U
SODIUM	181 J	202 J	173 J	193 J	176 J	219 J	262 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
VANADIUM	23.1	41.3	26.5	42	17.5	15.3	13.1	19.8	32.4	62.4	31.8	14.5
ZINC	13.2	8.2 J	7.8 J	10.8 J	17.5	16.8	16.1	4 U	4 UJ	4 U	4 U	4 U

APPENDIX TABLE A-5-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO06	13SO07	13SO08	13SO09	13SO10	13SO11	13SO12	13SO13	13SO14	13SO15	13SO15	13SO15
NSAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SAMPLE	13SO0601	13SO0701	13SO0801	13SO0901	13SO1001	13SO1101	13SO1201	13SO1301	13SO1401	13SO1501	13SO1501-AVG	13SO1501-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
METHYLENE CHLORIDE												
Semivolatile Organics (ug/kg)												
BIS(2-ETHYLHEXYL)PHTHALATE												
FLUORANTHENE												
PYRENE												
Inorganics (mg/kg)												
ALUMINUM												
ARSENIC	4.3	7.2	6.4	4.8	5.3	5.1	5.3	5.4	6.5	4.4	4.1	3.8
BARIUM												
BERYLLIUM												
CALCIUM												
CHROMIUM												
COBALT												
COPPER												
IRON												
LEAD												
MAGNESIUM												
MANGANESE												
MERCURY												
NICKEL												
POTASSIUM												
SELENIUM												
SILVER												
SODIUM												
VANADIUM												
ZINC												

APPENDIX TABLE A-5-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013	0013
LOCATION	13SO16	13SO17	13SO18	13SO19	13SO20	13SO27	13SO28	13SO31	13SO32	13SO32	13SO32
NSAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SAMPLE	13SO1601	13SO1701	13SO1801	13SO1901	13SO2001	13SO2701	13SO2801	13SO3101	13SO3201	13SO3201-AVG	13SO3201-D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999	8/5/1999
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
METHYLENE CHLORIDE											
Semivolatile Organics (ug/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE											
FLUORANTHENE											
PYRENE											
Inorganics (mg/kg)											
ALUMINUM											
ARSENIC	5.9	5.8	5.2	5.4	4.3	4.1	3.4	4.5	4.1	4.1	4.1
BARIUM											
BERYLLIUM											
CALCIUM											
CHROMIUM											
COBALT											
COPPER											
IRON											
LEAD											
MAGNESIUM											
MANGANESE											
MERCURY											
NICKEL											
POTASSIUM											
SELENIUM											
SILVER											
SODIUM											
VANADIUM											
ZINC											

APPENDIX TABLE A-5-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0013	0013	0013	0013	0013
LOCATION	TP-13-02	TP-13-03	TP-13-05	TP-13-05	TP-13-05
NSAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503-D
SAMPLE	13SS0201	13SS0302	13SS0503	13SS0503-AVG	13SS0503A
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 6	8 - 10	8 - 9	8 - 9	8 - 9
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/6/1992	10/6/1992	10/6/1992	10/6/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
2-BUTANONE	13 U	11 U	270	270	270
2-HEXANONE	13 U	3 J	56 U	19 J	19 J
4-METHYL-2-PENTANONE	13 U	11 U	27 J	30.5 J	34
ACETONE	86 J	67 J	700 J	640 J	580 J
CARBON DISULFIDE	13 U	2 J	56 U	43.5 U	31 U
TOLUENE	13 U	11 U	56 U	10 J	10 J
TOTAL XYLENES	2 J	2 J	56 U	12 J	12 J
Semivolatile Organics (ug/kg)					
4-METHYLPHENOL	430 U	68 J	1200	1095	990
BIS(2-ETHYLHEXYL)PHTHALATE	430 UJ	430 UJ	410 J	307.5 J	410 UJ
DIETHYL PHTHALATE	430 U	380 U	140 J	119.5 J	99 J
NAPHTHALENE	430 U	380 U	510	325 J	140 J
PHENOL	430 U	380 U	130 J	130 J	130 J
Inorganics (mg/kg)					
ALUMINUM	23900	10700	14800	13150	11500
ANTIMONY	2.9 U	2.8 U	3.7 J	2.575 J	2.9 U
ARSENIC	6.5	4.7	4.1	3.75	3.4
BARIUM	7.5 J	6.3 J	7.1 J	7.05 J	7 J
BERYLLIUM	0.2 J	0.16 J	0.17 J	0.165 J	0.16 J
CALCIUM	130 J	151 J	192 J	193 J	194 J
CHROMIUM	21	15.9	17.3	16.75	16.2
COBALT	1.4 J	0.75 J	1.3 J	0.965 J	0.63 J
COPPER	5.8 J	3.9 J	5 J	5.15 J	5.3 J
IRON	16200	13500	15600	13900	12200
LEAD	6	5.8	4.7	5.1	5.5
MAGNESIUM	97.7 J	73.2 J	74.8 J	73.85 J	72.9 J
MANGANESE	41.6	21.7	22.5	18.8	15.1
MERCURY	0.2 J	0.16 J	4.2	2.14 J	0.08 J
NICKEL	2.1 J	1.2 U	2.5 U	2.5 U	2.5 U
POTASSIUM	158 U	154 U	180 J	125 J	140 U
SILVER	0.53 J	0.5 J	0.62 J	0.57 J	0.52 J
SODIUM	206 J	211 J	206 J	200.5 J	195 J
VANADIUM	44.6	38.2	40.1	37.5	34.9
ZINC	10.2	6	7.3	7.05	6.8
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.1 U	0.1 U	0.1 U	0.085 J	0.12 J

APPENDIX TABLE A-5-5
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
METHYLENE CHLORIDE	4/10	4 J	8 J	11 - 17	5.95	5.00	13SO0501
Semivolatile Organics (ug/kg)							
BIS(2-ETHYLHEXYL)PHTHALATE	4/10	64 J	450	370 - 390	182	177	13-SL-04
FLUORANTHENE	1/10	51 J	51 J	370 - 400	174	51.0	13-SL-01
PYRENE	1/10	61 J	61 J	370 - 400	175	61.0	13-SL-01
Inorganics (mg/kg)							
ALUMINUM	10/10	8070	38300	---	16042	16042	13SO0301
ARSENIC	29/29	1.6 J	7.2	---	4.64	4.64	13SO0701
BARIUM	10/10	5.9 J	26.6 J	---	11.0	11.0	13SO0101
BERYLLIUM	4/10	0.06 J	0.16 J	0.06 - 1	0.290	0.0925	13-SL-04
CALCIUM	10/10	34.2 J	525 J	---	183	183	13-SL-01
CHROMIUM	10/10	6.9	27.9	---	13.9	13.9	13SO0301
COBALT	9/10	0.48 J	1.9 J	0.34	0.853	0.929	13SO0101
COPPER	6/10	4	9.2	5	5.00	6.67	13-SL-01
IRON	10/10	4960	23500	---	11427	11427	13SO0301
LEAD	10/10	3.2	10.5	---	6.20	6.20	13-SL-04
MAGNESIUM	10/10	50.6 J	203 J	---	116	116	13SO0301
MANGANESE	10/10	18.7	407 J	---	95.4	95.4	13SO0101
MERCURY	10/10	0.01 J	0.05 J	---	0.0320	0.0320	13-SL-02, 13-SL-05, 13-SL-05-D
NICKEL	7/10	2.8 J	6.7 J	2.4 - 2.5	2.96	3.71	13SO0301
POTASSIUM	1/10	150 J	150 J	132 - 1000	249	150	13SO0301
SELENIUM	1/10	0.27 J	0.27 J	0.46 - 1	0.345	0.270	13SO0301
SILVER	5/10	0.36 J	1.2 J	2	0.851	0.702	13-SL-04
SODIUM	5/10	173 J	262 J	1000	347	194	13-SL-05-D
VANADIUM	10/10	13.1	62.4	---	30.9	30.9	13SO0301
ZINC	5/10	7.8 J	17.5	4	6.68	11.4	13-SL-05

APPENDIX TABLE A-5-6
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	1/3	270	270	11 - 13	94.0	270	13SS0503, 13SS0503-D
2-HEXANONE	2/3	3 J	19 J	13 - 56	9.50	11.0	13SS0503-D
4-METHYL-2-PENTANONE	1/3	27 J	34	11 - 13	14.2	30.5	13SS0503-D
ACETONE	3/3	67 J	700 J	---	264	264	13SS0503
CARBON DISULFIDE	1/3	2 J	2 J	13 - 56	10.1	2.00	13SS0302
TOLUENE	1/3	10 J	10 J	11 - 56	7.33	10.0	13SS0503-D
TOTAL XYLENES	3/3	2 J	12 J	56	5.33	5.33	13SS0503-D
Semivolatile Organics (ug/kg)							
4-METHYLPHENOL	2/3	68 J	1200	430	459	582	13SS0503
BIS(2-ETHYLHEXYL)PHTHALATE	1/3	410 J	410 J	410 - 430	246	308	13SS0503
DIETHYL PHTHALATE	1/3	99 J	140 J	380 - 430	175	120	13SS0503
NAPHTHALENE	1/3	140 J	510	380 - 430	243	325	13SS0503
PHENOL	1/3	130 J	130 J	380 - 430	178	130	13SS0503, 13SS0503-D
Inorganics (mg/kg)							
ALUMINUM	3/3	10700	23900	---	15917	15917	13SS0201
ANTIMONY	1/3	3.7 J	3.7 J	2.8 - 2.9	1.81	2.58	13SS0503
ARSENIC	3/3	3.4	6.5	---	4.98	4.98	13SS0201
BARIUM	3/3	6.3 J	7.5 J	---	6.95	6.95	13SS0201
BERYLLIUM	3/3	0.16 J	0.2 J	---	0.175	0.175	13SS0201
CALCIUM	3/3	130 J	194 J	---	158	158	13SS0503-D
CHROMIUM	3/3	15.9	21	---	17.9	17.9	13SS0201
COBALT	3/3	0.63 J	1.4 J	---	1.04	1.04	13SS0201
COPPER	3/3	3.9 J	5.8 J	---	4.95	4.95	13SS0201
IRON	3/3	12200	16200	---	14533	14533	13SS0201
LEAD	3/3	4.7	6	---	5.63	5.63	13SS0201
MAGNESIUM	3/3	72.9 J	97.7 J	---	81.6	81.6	13SS0201
MANGANESE	3/3	15.1	41.6	---	27.4	27.4	13SS0201
MERCURY	3/3	0.08 J	4.2	---	0.833	0.833	13SS0503
NICKEL	1/3	2.1 J	2.1 J	1.2 - 2.5	1.32	2.10	13SS0201
POTASSIUM	1/3	180 J	180 J	140 - 158	93.7	125	13SS0503
SILVER	3/3	0.5 J	0.62 J	---	0.533	0.533	13SS0503
SODIUM	3/3	195 J	211 J	---	206	206	13SS0302
VANADIUM	3/3	34.9	44.6	---	40.1	40.1	13SS0201
ZINC	3/3	6	10.2	---	7.75	7.75	13SS0201
Miscellaneous Parameter (mg/kg)							
CYANIDE	1/3	0.12 J	0.12 J	0.1	0.0617	0.0850	13SS0503-D

APPENDIX TABLE A-5-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)													
METHYLENE CHLORIDE	**10**	**4**	**40%**	**4.00**	**8.00**	**5.95**	**5.00**	**1.54**	**-0.228**	**Shapiro-Wilk**	**Normal/Lognormal**	**6.84**	**Student-t**
Semivolatile Organics (ug/kg)													
BIS(2-ETHYLHEXYL)PHTHALATE	**10**	**4**	**40%**	**64.0**	**450**	**182**	**177**	**105**	**1.93**	**Shapiro-Wilk**	**Lognormal**	**276**	**H-UCL**
FLUORANTHENE	**10**	**1**	**10%**	**51.0**	**51.0**	**174**	**51.0**	**43.4**	**-3.108**	**Shapiro-Wilk**	**Undefined**	**51.0**	**Maximum Detected Concentration**
PYRENE	**10**	**1**	**10%**	**61.0**	**61.0**	**175**	**61.0**	**40.2**	**-3.099**	**Shapiro-Wilk**	**Undefined**	**61.0**	**Maximum Detected Concentration**
Inorganics (mg/kg)													
ALUMINUM	10	10	100%	9285	38300	16042	16042	8775	2.10	Shapiro-Wilk	Lognormal	21944	H-UCL
ARSENIC	29	29	100%	1.60	7.20	4.64	4.64	1.41	-0.163	Shapiro-Wilk	Normal/Lognormal	5.09	Student-t
BARIUM	10	10	100%	5.90	26.6	11.0	11.0	6.04	2.27	Shapiro-Wilk	Lognormal	14.8	H-UCL
BERYLLIUM	**10**	**4**	**40%**	**0.060**	**0.160**	**0.290**	**0.093**	**0.224**	**-0.069**	**Shapiro-Wilk**	**Undefined**	0.160	Maximum Detected Concentration
CALCIUM	10	10	100%	34.2	525	183	183	167	1.18	Shapiro-Wilk	Lognormal	500	H-UCL
CHROMIUM	10	10	100%	6.90	27.9	13.9	13.9	6.31	1.19	Shapiro-Wilk	Normal/Lognormal	17.6	Student-t
COBALT	10	9	90%	0.480	1.90	0.853	0.929	0.497	0.904	Shapiro-Wilk	Normal/Lognormal	1.57	H-UCL
COPPER	**10**	**6**	**60%**	**4.10**	**9.20**	**5.00**	**6.67**	**2.58**	**0.453**	**Shapiro-Wilk**	**Normal/Lognormal**	7.65	H-UCL
IRON	10	10	100%	5620	23500	11427	11427	5454	1.21	Shapiro-Wilk	Normal/Lognormal	14589	Student-t
LEAD	10	10	100%	3.60	10.5	6.20	6.20	2.02	1.06	Shapiro-Wilk	Normal/Lognormal	7.37	Student-t
MAGNESIUM	10	10	100%	54.1	203	116	116	44.5	0.856	Shapiro-Wilk	Normal/Lognormal	142	Student-t
MANGANESE	10	10	100%	18.7	407	95.4	95.4	116	2.57	Shapiro-Wilk	Lognormal	221	H-UCL
MERCURY	10	10	100%	0.010	0.050	0.032	0.032	0.014	-0.134	Shapiro-Wilk	Normal/Lognormal	0.0487	H-UCL
NICKEL	10	7	70%	2.08	6.70	2.96	3.71	1.72	1.05	Shapiro-Wilk	Normal/Lognormal	4.83	H-UCL
POTASSIUM	**10**	**1**	**10%**	**150**	**150**	**249**	**150**	**217**	**0.441**	**Shapiro-Wilk**	**Undefined**	150	Maximum Detected Concentration
SELENIUM	**10**	**1**	**10%**	**0.270**	**0.270**	**0.345**	**0.270**	**0.134**	**0.459**	**Shapiro-Wilk**	**Undefined**	0.270	Maximum Detected Concentration
SILVER	**10**	**5**	**50%**	**0.390**	**1.20**	**0.851**	**0.702**	**0.269**	**-0.863**	**Shapiro-Wilk**	**Normal**	1.01	Student-t
SODIUM	**10**	**5**	**50%**	**173**	**219**	**347**	**194**	**162**	**-0.019**	**Shapiro-Wilk**	**Undefined**	219	Maximum Detected Concentration
VANADIUM	10	10	100%	14.5	62.4	30.9	30.9	14.7	1.03	Shapiro-Wilk	Normal/Lognormal	39.4	Student-t
ZINC	**10**	**5**	**50%**	**7.80**	**16.8**	**6.68**	**11.4**	**5.53**	**0.720**	**Shapiro-Wilk**	**Undefined**	**9.29**	**Non-Parametric UCL**

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

APPENDIX FIGURE A-5-8
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
2-BUTANONE	**5**	**3**	**270**	**270**	**164**	**270**	**145**	**-0.609**	**Data Follow Gamma Distribution (0.05)**	**997**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
2-HEXANONE	**5**	**3**	**3**	**19.0**	**15.1**	**13.7**	**10.2**	**-0.056**	**Data are Normal (0.05)**	**24.8**	**Student-t**	**UCL > Max Detect**
4-METHYL-2-PENTANONE	**5**	**3**	**27**	**34.0**	**20.7**	**30.5**	**13.7**	**-0.464**	**Data are Normal (0.05)**	**33.7**	**Student-t**	**- -**
ACETONE	5	5	67	700	415	415	312	-0.527	Data are Normal (0.05)	712	Student-t	UCL > Max Detect
CARBON DISULFIDE	**5**	**1**	**2**	**2.00**	**14.8**	**2.00**	**10.7**	**0.012**	**Data are Normal (0.05)**	**24.9**	**Student-t**	**UCL > Max Detect**
TOLUENE	**5**	**2**	**10**	**10.0**	**12.0**	**10.0**	**9.17**	**1.97**	**Data Follow Gamma Distribution (0.05)**	**26.5**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
TOTAL XYLENES	5	4	2	12.0	11.2	7.00	10.6	1.10	Data are Normal (0.05)	21.3	Student-t	UCL > Max Detect
4-METHYLPHENOL	5	4	68	1200	714	838	530	-0.563	Data are Normal (0.05)	1219	Student-t	UCL > Max Detect
BIS(2-ETHYLHEXYL)PHTHALATE	**5**	**2**	**307.5**	**410**	**271**	**359**	**88.4**	**1.29**	**Data are Normal (0.05)**	**355**	**Student-t**	**Max ND > UCL**
DIETHYL PHTHALATE	**5**	**3**	**99**	**140**	**153**	**120**	**48.5**	**0.365**	**Data are Normal (0.05)**	**199**	**Student-t**	**UCL > Max Detect**
NAPHTHALENE	**5**	**3**	**140**	**510**	**276**	**325**	**147**	**1.25**	**Data are Normal (0.05)**	**416**	**Student-t**	**Max ND > UCL**
PHENOL	**5**	**3**	**130**	**130**	**159**	**130**	**40.7**	**0.818**	**Data are Non-parametric (0.05)**	**198**	**Student-t or Modified-t UCL**	**UCL > Max Detect**
ALUMINUM	5	5	10700	23900	14810	14810	5321	1.77	Data are Normal (0.05)	19883	Student-t	- -
ANTIMONY	**5**	**2**	**2.575**	**3.70**	**2.12**	**3.14**	**1.01**	**1.25**	**Data are Normal (0.05)**	**3.08**	**Student-t**	**- -**
ARSENIC	5	5	3.4	6.50	4.49	4.49	1.22	1.45	Data are Normal (0.05)	5.65	Student-t	- -
BARIUM	5	5	6.3	7.50	6.99	6.99	0.434	-0.993	Data are Normal (0.05)	7.40	Student-t	- -
BERYLLIUM	5	5	0.16	0.200	0.171	0.171	0.017	1.91	Data Follow Gamma Distribution (0.05)	0.189	Approximate Gamma 95% UCL	- -
CALCIUM	5	5	130	194	172	172	29.7	-0.881	Data are Normal (0.05)	200	Student-t	UCL > Max Detect
CHROMIUM	5	5	15.9	21.0	17.4	17.4	2.07	1.88	Data are Normal (0.05)	19.4	Student-t	- -
COBALT	5	5	0.63	1.40	1.01	1.01	0.335	0.138	Data are Normal (0.05)	1.33	Student-t	- -
COPPER	5	5	3.9	5.80	5.03	5.03	0.700	-1.174	Data are Normal (0.05)	5.70	Student-t	- -
IRON	5	5	12200	16200	14280	14280	1621	-0.015	Data are Normal (0.05)	15825	Student-t	- -
LEAD	5	5	4.7	6.00	5.42	5.42	0.526	-0.444	Data are Normal (0.05)	5.92	Student-t	- -
MAGNESIUM	5	5	72.9	97.7	78.5	78.5	10.8	2.21	Data are Non-parametric (0.05)	88.8	Student-t or Modified-t UCL	- -
MANGANESE	5	5	15.1	41.6	23.9	23.9	10.3	1.78	Data are Normal (0.05)	33.8	Student-t	- -
MERCURY	5	5	0.08	4.20	1.36	1.36	1.81	1.28	Data are Normal (0.05)	3.08	Student-t	- -
NICKEL	**5**	**1**	**2.1**	**2.10**	**1.29**	**2.10**	**0.533**	**0.557**	**Data are Normal (0.05)**	**1.80**	**Student-t**	**Max ND > UCL**
POTASSIUM	**5**	**2**	**125**	**180**	**106**	**153**	**46.6**	**1.30**	**Data are Normal (0.05)**	**151**	**Student-t**	**Max ND > UCL**
SODIUM	5	5	195	211	204	204	6.12	-0.505	Data are Normal (0.05)	210	Student-t	- -
SILVER	5	5	0.5	0.620	0.548	0.548	0.048	0.946	Data are Normal (0.05)	0.593	Student-t	- -
VANADIUM	5	5	34.9	44.6	39.1	39.1	3.61	0.836	Data are Normal (0.05)	42.5	Student-t	- -
ZINC	5	5	6	10.2	7.47	7.47	1.60	1.70	Data are Normal (0.05)	9.00	Student-t	- -
CYANIDE	**5**	**2**	**0.085**	**0.120**	**0.071**	**0.103**	**0.031**	**1.26**	**Data are Normal (0.05)**	**0.101**	**Student-t**	**- -**

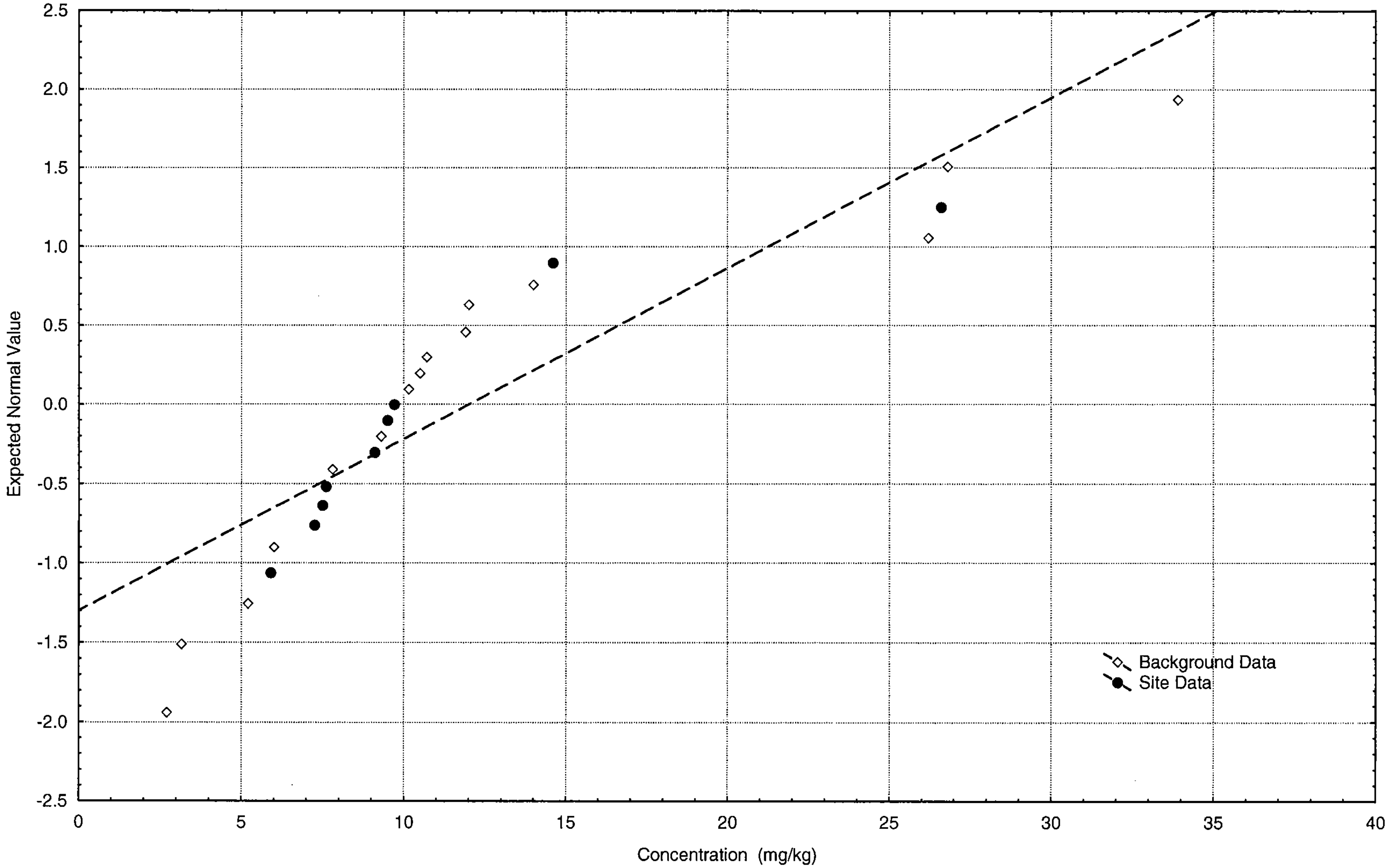
Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
1/2 the detection limit was used for B qualified data.

Associated Samples
13SS0201
13SS0302
13SS0503
13SS0503-AVG
13SS0503-D

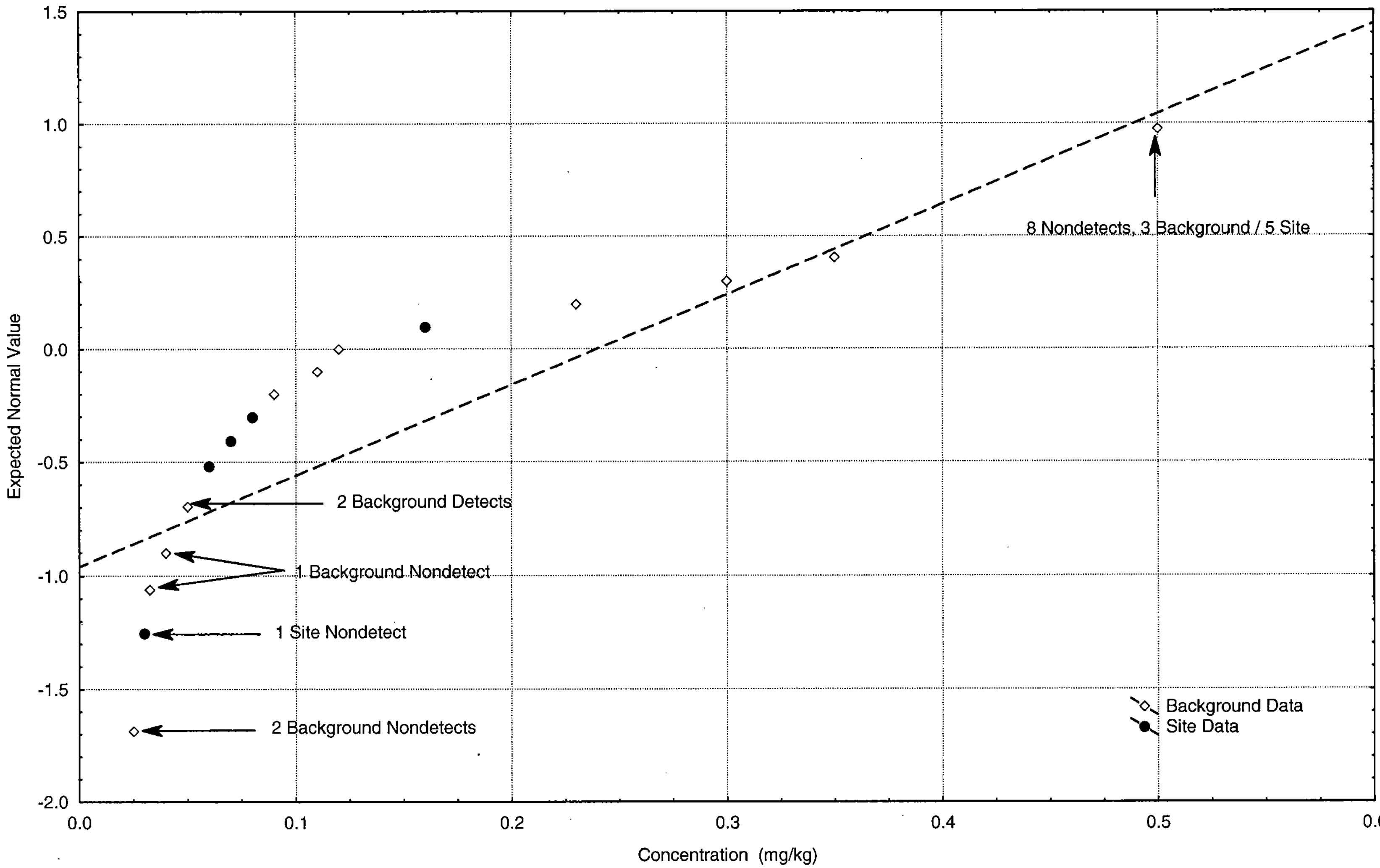
APPENDIX TABLE A-5-9
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 13 SURFACE SOIL																			
CHROMIUM	10/10	15/15	25/25	0%	PASS	27.9	16.3	13.9	6.12	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	17.5	0.000352	**YES**	---	**YES**
COPPER	6/10	12/15	18/25	28%	PASS	9.2	8.5	5.00	3.97	NORMAL	LOGNORMAL	**FAIL**	---	WRS	0.729	0.466	NO	PASS	NO
LEAD	10/10	15/15	25/25	0%	PASS	10.5	9.8 J	6.20	5.49	LOGNORMAL	NORMAL	**FAIL**	---	WRS	0.832	0.405	NO	PASS	NO
MERCURY	10/10	**5/15**	15/25	40%	**FAIL**	0.05 J	0.07 J	0.0320	0.0355	---	---	---	---	Proportions	-1.20	0.114	NO	PASS	NO
NICKEL	7/10	**6/15**	13/25	48%	**FAIL**	6.7 J	5.9 J	2.96	2.65	---	---	---	---	Proportions	0.445	0.328	NO	PASS	NO
ZINC	5/10	13/15	18/25	28%	PASS	16.8	16.3 J	6.68	7.66	UNDEFINED	NORMAL	**FAIL**	---	WRS	-0.729	0.466	NO	PASS	NO
SITE 13 SUBSURFACE SOIL																			
CHROMIUM	3/3	14/14	17/17	0%	PASS	21	30	17.9	11.4	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	2.60	0.128	NO	PASS	NO

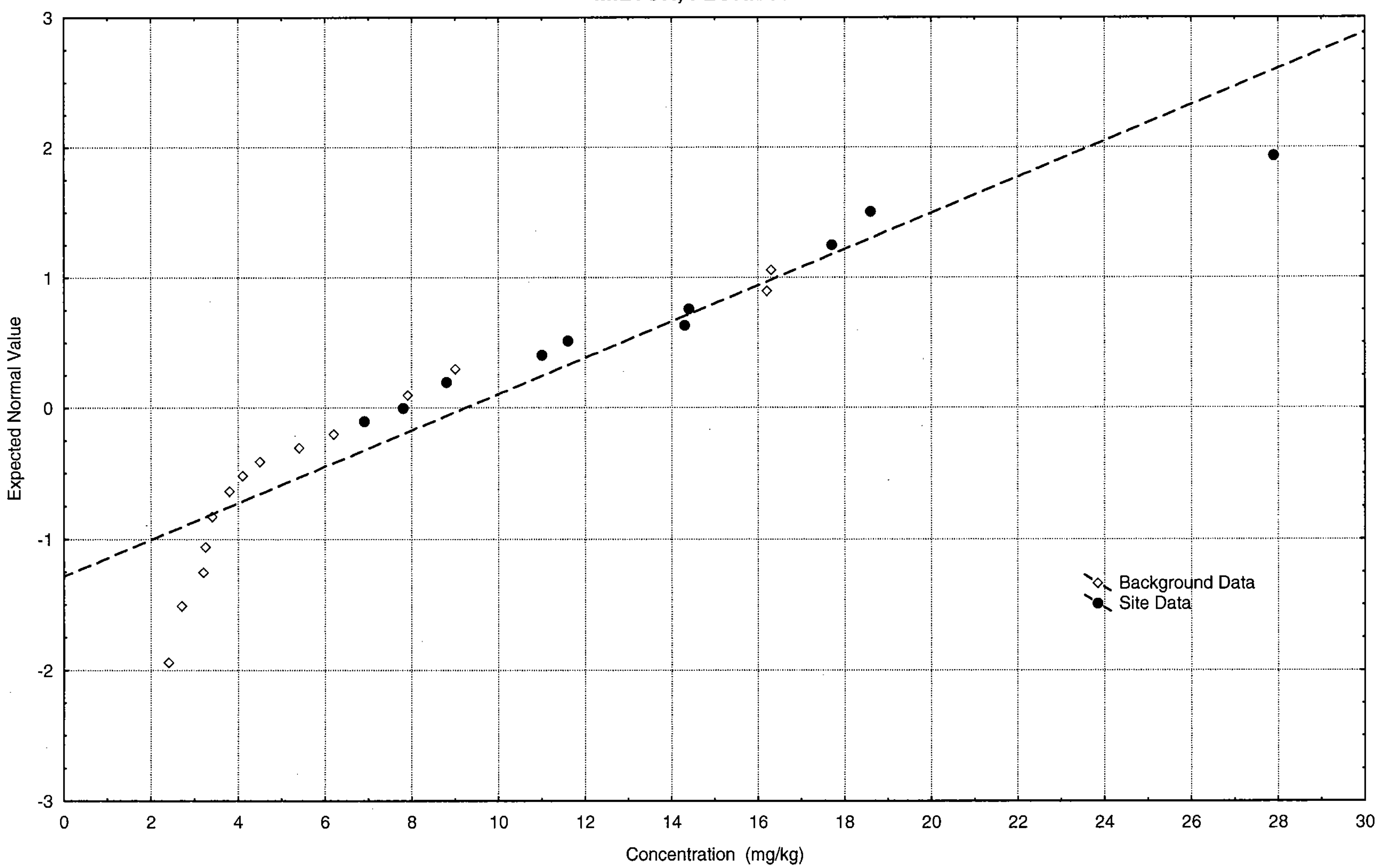
APPENDIX FIGURE A-5-1
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



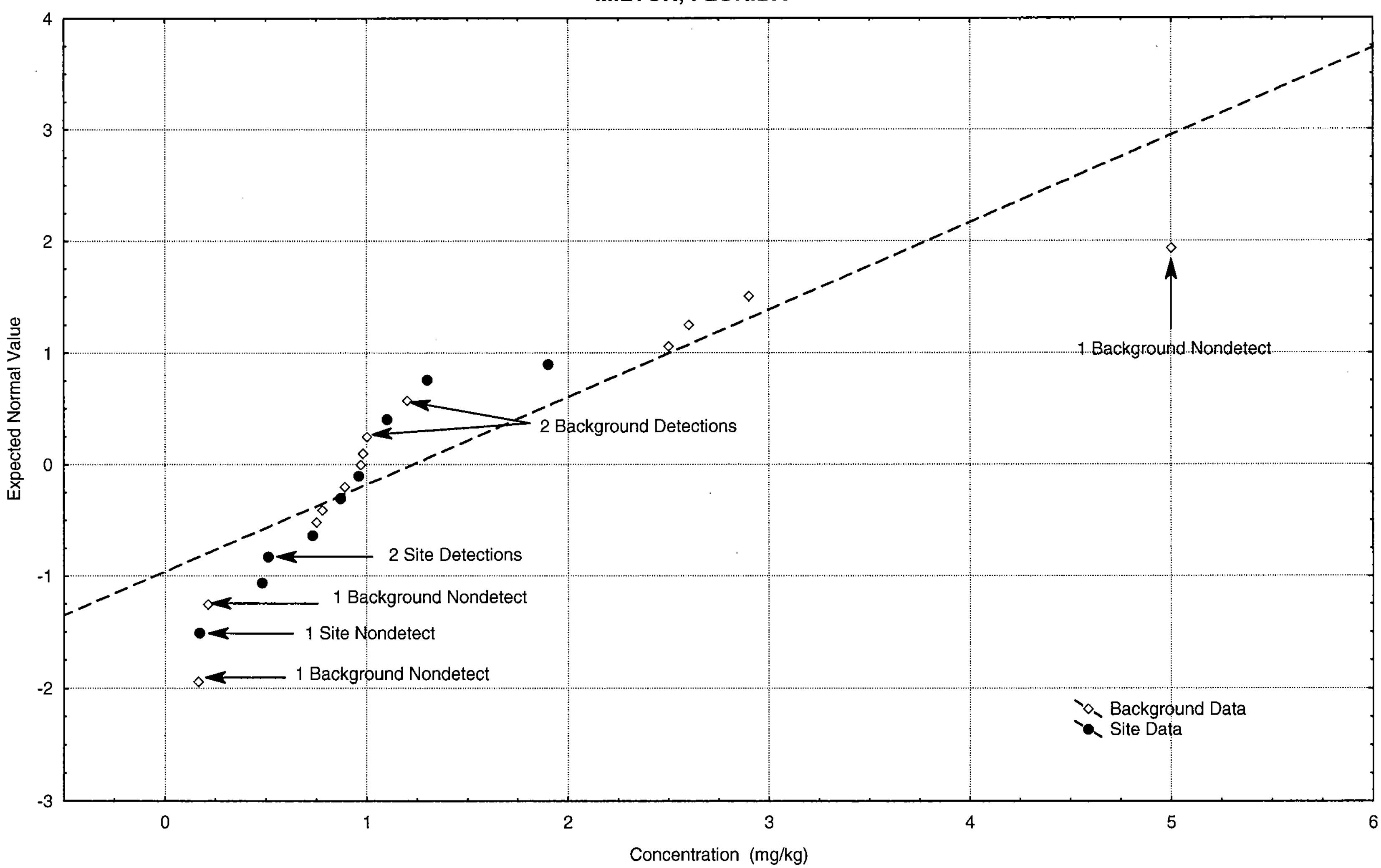
APPENDIX FIGURE A-5-2
NORMAL PROBABILITY PLOT - BERYLLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



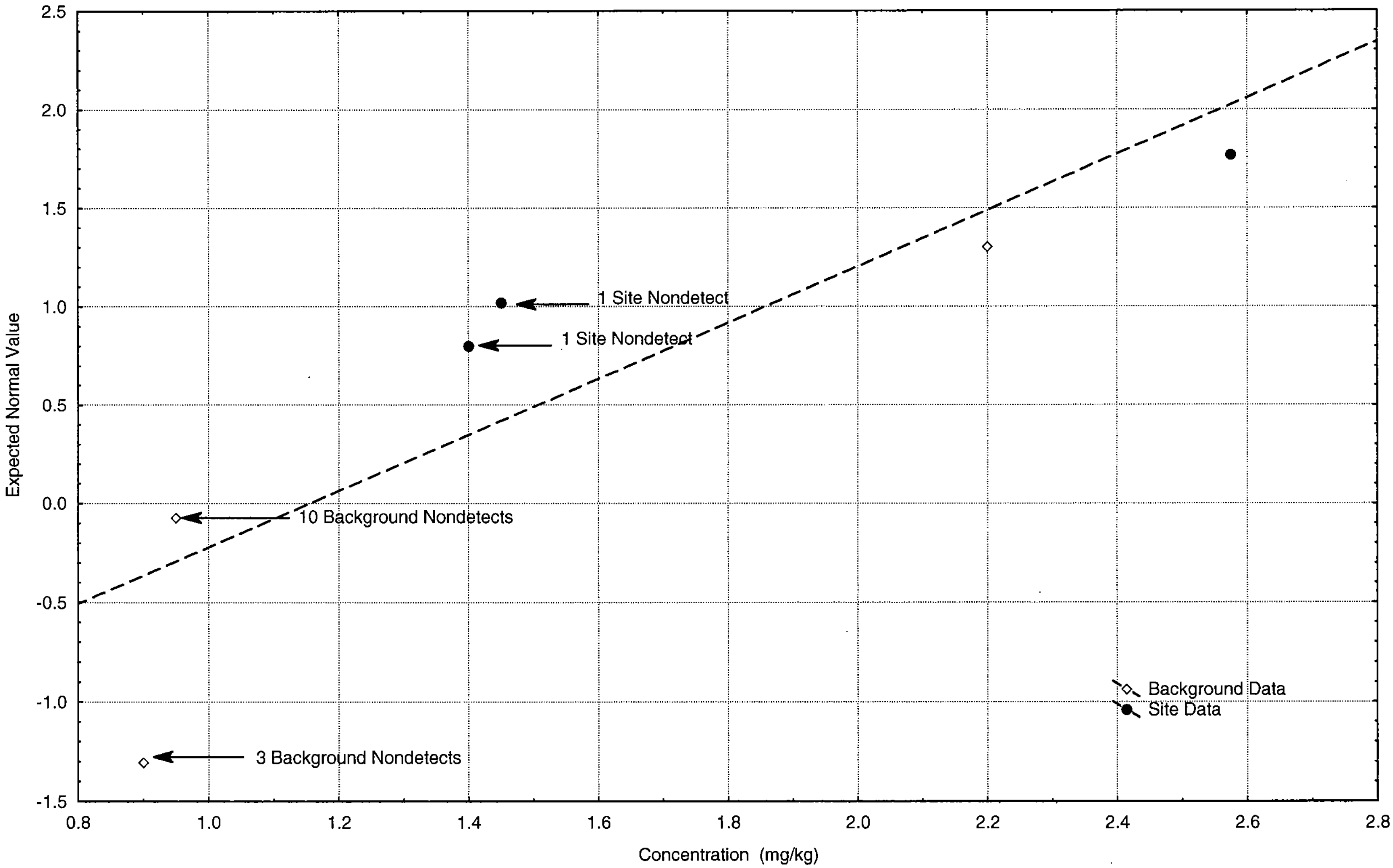
APPENDIX FIGURE A-5-3
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



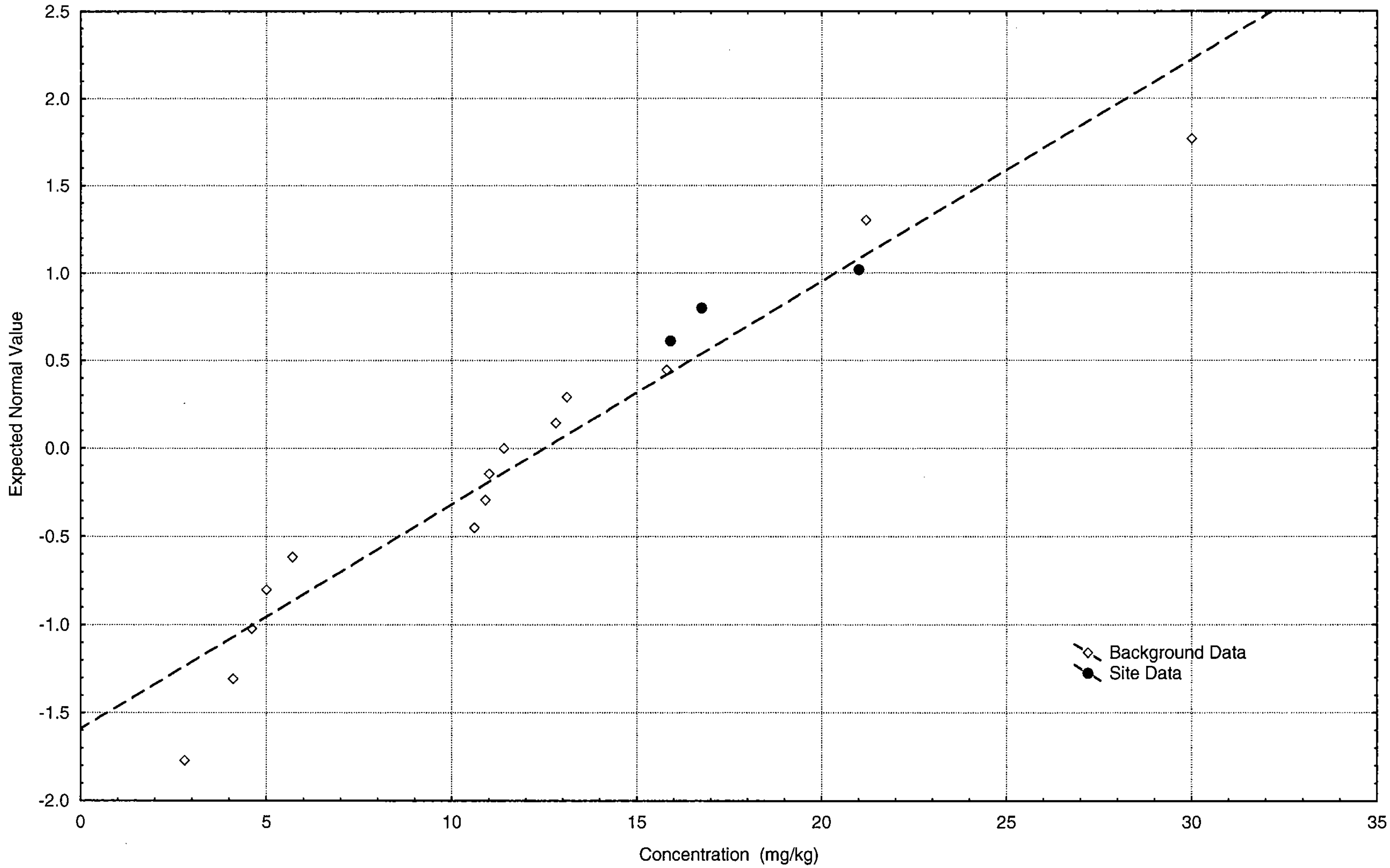
APPENDIX FIGURE A-5-4
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



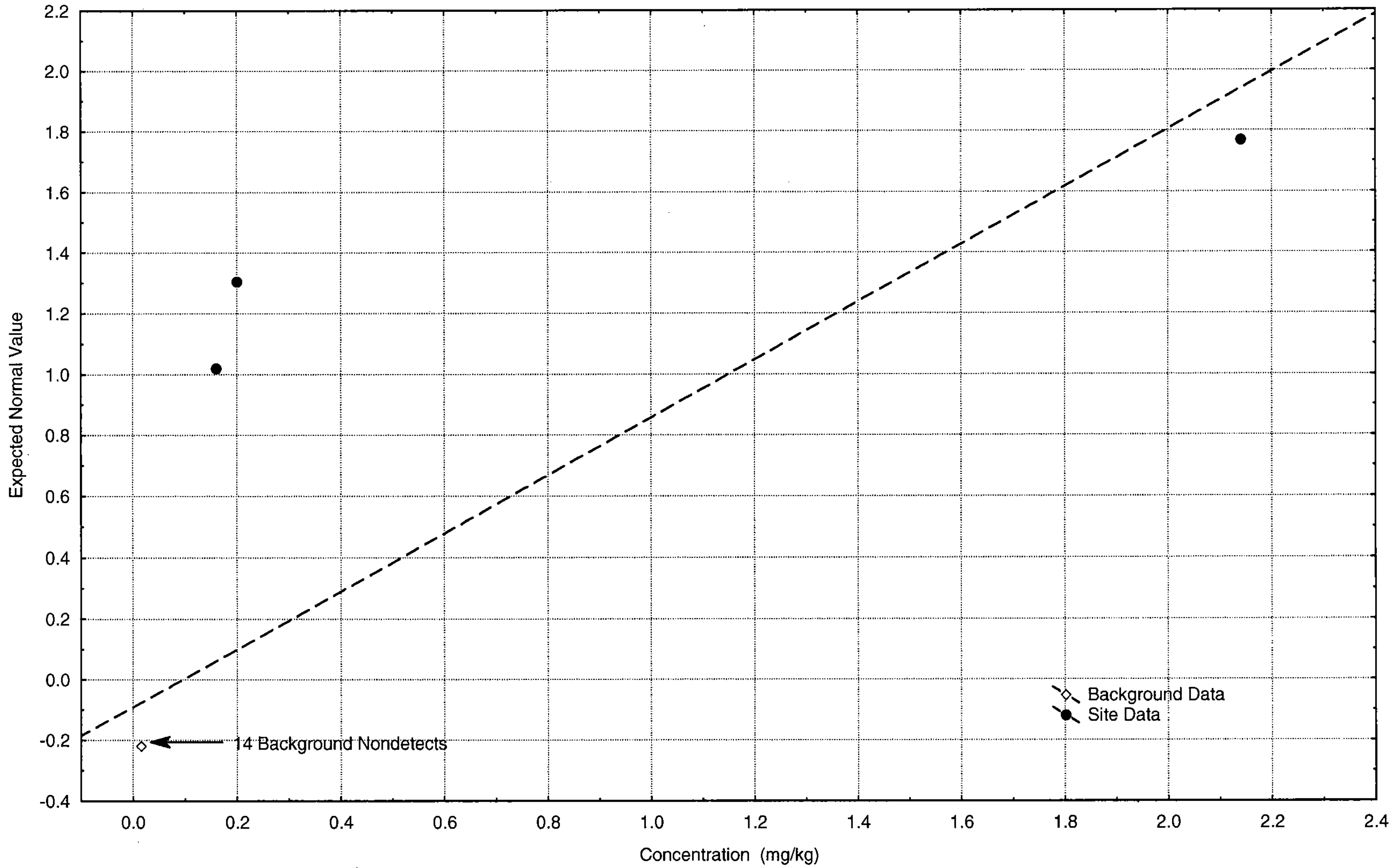
APPENDIX FIGURE A-5-5
NORMAL PROBABILITY PLOT - ANTIMONY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-5-6
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-5-7
NORMAL PROBABILITY PLOT - MERCURY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.6

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 14, SHORT-TERM SANITARY LANDFILL

APPENDIX TABLE A-6-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014	0014	0014	0014	0014	0014	0014
LOCATION	14-SL-01	14-SL-02	14-SL-03	14S-001	14S-001	14S-001	14S-002	14S-003
NSAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101-D	14S00201	14S00301
SAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101D	14S00201	14S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
1,1,2-TRICHLOROETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
1,1-DICHLOROETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
1,1-DICHLOROETHENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
1,2-DICHLOROETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
1,2-DICHLOROPROPANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U	11 U
2-HEXANONE	11 U	11 U	11 U	11 U	11.5 UJ	12 UJ	11 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	11.5 UJ	12 UJ	11 U	11 U
ACETONE	11 UJ	11 UJ	11 U	11 U	11.5 U	12 U	28 U	11 U
BENZENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
BROMODICHLOROMETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
BROMOFORM	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U	11 U
CARBON DISULFIDE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
CARBON TETRACHLORIDE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
CHLOROBENZENE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
CHLORODIBROMOMETHANE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U	11 U
CHLOROFORM	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
ETHYLBENZENE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
METHYLENE CHLORIDE	6 UJ	6 UJ	6 UJ	6 J	6 J	12 U	11 U	8 J
STYRENE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
TETRACHLOROETHENE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
TOLUENE	6 U	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
TOTAL XYLENES	2 J	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
TRICHLOROETHENE	6 U	6 U	5 U	11 U	11.5 U	12 U	11 U	11 U
VINYL ACETATE	11 U	11 U	11 U					
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11.5 U	12 U	11 U	11 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
1,2-DICHLOROBENZENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
1,3-DICHLOROBENZENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
1,4-DICHLOROBENZENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U

APPENDIX TABLE A-6-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014	0014	0014	0014	0014	0014	0014
LOCATION	14-SL-01	14-SL-02	14-SL-03	14S-001	14S-001	14S-001	14S-002	14S-003
NSAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101-D	14S00201	14S00301
SAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101D	14S00201	14S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1800 U	1800 U	1700 U	950 U	950 U	950 U	920 U	920 U
2,4,6-TRICHLOROPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2,4-DICHLOROPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2,4-DIMETHYLPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2,4-DINITROPHENOL	1800 U	1800 U	1700 U	950 U	950 UJ	950 UJ	920 UJ	920 UJ
2,4-DINITROTOLUENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2,6-DINITROTOLUENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2-CHLORONAPHTHALENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2-CHLOROPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2-METHYLNAPHTHALENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2-METHYLPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
2-NITROANILINE	1800 UJ	1800 UJ	1700 UJ	950 U	950 U	950 U	920 U	920 U
2-NITROPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
3,3'-DICHLOROBENZIDINE	730 U	760 U	710 U	380 U	380 U	380 U	370 U	370 U
3-NITROANILINE	1800 UJ	1800 UJ	1700 UJ	950 U	950 U	950 U	920 U	920 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	1700 U	950 U	950 UJ	950 UJ	920 UJ	920 UJ
4-BROMOPHENYL PHENYL ETHER	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
4-CHLORO-3-METHYLPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
4-CHLOROANILINE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
4-METHYLPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
4-NITROANILINE	1800 UJ	1800 UJ		950 U	950 U	950 U	920 U	920 U
4-NITROPHENOL	1800 UJ	1800 UJ	1700 UJ	950 U	950 U	950 U	920 U	920 U
ACENAPHTHENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
ACENAPHTHYLENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
ANTHRACENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BENZO(A)ANTHRACENE	370 U	380 UJ	350 U	380 U	380 U	380 U	370 U	370 U
BENZO(A)PYRENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BENZO(B)FLUORANTHENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BENZO(G,H,I)PERYLENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BENZO(K)FLUORANTHENE	370 U	380 U	350 U	380 U	380 UJ	380 UJ	370 UJ	370 UJ
BENZOIC ACID	1800 U	1800 U	1700 U					
BENZYL ALCOHOL	370 U	380 U	350 U					
BIS(2-CHLOROETHOXY)METHANE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BIS(2-CHLOROETHYL)ETHER	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	40 J	350 U	380 U	380 U	380 U	370 U	370 U
BUTYL BENZYL PHTHALATE	370 UJ	380 UJ	350 UJ	380 U	380 U	380 U	370 U	370 U
CHRYSENE	370 UJ	380 J	350 UJ	380 U	380 U	380 U	370 U	370 U
DI-N-BUTYL PHTHALATE	370 U	380 UJ	350 UJ	380 U	380 U	380 U	370 U	370 U
DI-N-OCTYL PHTHALATE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
DIBENZO(A,H)ANTHRACENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U

APPENDIX TABLE A-6-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014	0014	0014	0014	0014	0014	0014
LOCATION	14-SL-01	14-SL-02	14-SL-03	14S-001	14S-001	14S-001	14S-002	14S-003
NSAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101-D	14S00201	14S00301
SAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101D	14S00201	14S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
DIETHYL PHTHALATE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
DIMETHYL PHTHALATE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
FLUORANTHENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
FLUORENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
HEXACHLOROBENZENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
HEXACHLOROBUTADIENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
HEXACHLOROCYCLOPENTADIENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
HEXACHLOROETHANE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
INDENO(1,2,3-CD)PYRENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
ISOPHORONE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
N-NITROSODIPHENYLAMINE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
NAPHTHALENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
NITROBENZENE	370 U	380 U	350 U	380 U	380 UJ	380 UJ	370 UJ	370 UJ
PENTACHLOROPHENOL	1800 U	1800 U	1700 U	950 U	950 UJ	950 UJ	920 UJ	920 UJ
PHENANTHRENE	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
PHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
PYRENE	370 UJ	380 UJ	350 UJ	380 U	380 U	380 U	370 U	370 U
Pesticides PCBs (ug/kg)								
4,4'-DDD	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
4,4'-DDE	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
4,4'-DDT	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
ALDRIN	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-BHC	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-CHLORDANE	89 U	92 U	86 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
AROCLOR-1016	89 U	92 U	86 U	37 U	37 U	37 U	37 U	36 U
AROCLOR-1221	89 U	92 U	86 U	76 U	76 U	76 U	74 U	74 U
AROCLOR-1232	89 U	92 U	86 U	37 U	37 U	37 U	37 U	36 U
AROCLOR-1242	89 U	92 U	86 U	37 U	37 U	37 U	37 U	36 U
AROCLOR-1248	89 U	92 U	86 U	37 U	37 U	37 U	37 U	36 U
AROCLOR-1254	180 U	180 U	170 U	37 U	37 U	37 U	37 U	36 U
AROCLOR-1260	180 U	180 U	170 U	37 U	37 U	37 U	37 U	36 U
BETA-BHC	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DELTA-BHC	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DIELDRIN	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
ENDOSULFAN I	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
ENDOSULFAN SULFATE	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
ENDRIN	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U

APPENDIX TABLE A-6-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0014**	**0014**	**0014**	**0014**	**0014**	**0014**	**0014**	**0014**
LOCATION	**14-SL-01**	**14-SL-02**	**14-SL-03**	**14S-001**	**14S-001**	**14S-001**	**14S-002**	**14S-003**
NSAMPLE	**14-SL-01**	**14-SL-02**	**14-SL-03**	**14S00101**	**14S00101-AVG**	**14S00101-D**	**14S00201**	**14S00301**
SAMPLE	**14-SL-01**	**14-SL-02**	**14-SL-03**	**14S00101**	**14S00101-AVG**	**14S00101D**	**14S00201**	**14S00301**
SUBMATRIX	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**	**SS**
SACODE	**NORMAL**	**NORMAL**	**NORMAL**	**ORIG**	**AVG**	**DUP**	**NORMAL**	**NORMAL**
DEPTH RANGE	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**	**0 - 1**
STATUS	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**	**NORMAL**
SAMPLE DATE	**8/11/1992**	**8/11/1992**	**8/11/1992**	**12/8/1995**	**12/8/1995**	**12/8/1995**	**12/8/1995**	**12/8/1995**
COLLECTION METHOD	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**	**GRAB**
ENDRIN KETONE	18 U	18 U	17 U	3.7 U	3.7 U	3.7 U	3.7 U	3.6 U
GAMMA-BHC (LINDANE)	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE	89 U	92 U	86 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	8.9 U	9.2 U	8.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR	89 U	92 U	86 U	19 U	19 U	19 U	19 U	19 U
TOXAPHENE	180 U	180 U	170 U	190 U	190 U	190 U	190 U	190 U
Inorganics (mg/kg)								
ALUMINUM	20400	13500	11800	11600	11550	11500	23800	10100
ANTIMONY	2.7 U	2.8 U	2.7 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	4.2	2.2 J	1.8 J	1.5 J	1.7 J	1.9 J	4.3	1.7 J
BARIUM	12 J	6.2 J	17.1 J	23.3 J	24.95 J	26.6 J	11.9 J	14.9 J
BERYLLIUM	0.15 J	0.13 J	0.12 J	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	0.61 U	0.94 J	0.59 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	118 J	80.9 J	110 J	120 J	151.5 J	183 J	56.6 J	51.9 J
CHROMIUM	17	17.6	7.2	7.8	7.8	7.8	19.6	5.9
COBALT	1.5 J	1.5 J	1.8 J	1.8 J	1.7 J	1.6 J	0.65 J	1.3 J
COPPER	4.9 J	5.1 J	7.8	5 UJ	5 UJ	5 UJ	5 U	5 UJ
IRON	14300	15800	7120	6310	6470	6630	15500	5470
LEAD	5.7 J	5.1 J	4.3 J	7.7 J	9.8 J	11.9 J	6.2 J	5.3 J
MAGNESIUM	87.4 J	48.6 J	106 J	177 J	169.5 J	162 J	142 J	122 J
MANGANESE	62.3	33.6	113	521 J	559 J	597 J	43.6 J	313 J
MERCURY	0.08 U	0.09 U	0.08 U	0.04 J	0.04 J	0.04 J	0.02 J	0.04 J
NICKEL	2.4 U	2.4 U	2.3 U	4.1 J	4.35 J	4.6 J	5 J	3.5 J
POTASSIUM	133 U	137 U	129 U	144 J	144 J	1000 U	174 J	1000 U
SELENIUM	0.41 U	0.43 U	0.4 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SILVER	0.33 U	0.34 U	0.32 U	2 U	2 U	2 U	2 U	2 U
SODIUM	170 J	179 J	180 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
THALLIUM	0.46 U	0.47 U	0.44 U	2 UJ	2 UJ	2 U	2 UJ	2 U
VANADIUM	37.4	42.1	16.9	16.8	17.1	17.4	41.1	14.1
ZINC	7.7 J	11.1	7.8 J	4 U	4 U	4 U	4 U	4 UJ
Miscellaneous Parameters (mg/kg)								
CYANIDE	0.24 U	0.25 U	0.24 U	0.07 J	0.07 J	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-6-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0014**	**0014**
LOCATION	**TP-14-01**	**TP-14-02**
NSAMPLE	**14SS0101**	**14SS0202**
SAMPLE	**14SS0101**	**14SS0202**
SUBMATRIX	**SB**	**SB**
SACODE	**NORMAL**	**NORMAL**
DEPTH RANGE	**5 - 6**	**11.5 - 12.5**
STATUS	**NORMAL**	**NORMAL**
SAMPLE DATE	**10/8/1992**	**10/8/1992**
COLLECTION METHOD	**GRAB**	**GRAB**
Volatile Organics (ug/kg)		
1,1,1-TRICHLOROETHANE	12 U	57 U
1,1,2,2-TETRACHLOROETHANE	12 U	57 U
1,1,2-TRICHLOROETHANE	12 U	57 U
1,1-DICHLOROETHANE	12 UJ	57 UJ
1,1-DICHLOROETHENE	12 U	57 U
1,2-DICHLOROETHANE	12 U	57 U
1,2-DICHLOROPROPANE	12 U	57 U
2-BUTANONE	12 UJ	57 UJ
2-HEXANONE	12 UJ	57 UJ
4-METHYL-2-PENTANONE	12 UJ	57 UJ
ACETONE	72 UJ	170 J
BENZENE	12 U	57 U
BROMODICHLOROMETHANE	12 U	57 U
BROMOFORM	12 U	57 U
BROMOMETHANE	12 U	57 U
CARBON DISULFIDE	12 U	57 U
CARBON TETRACHLORIDE	12 U	57 U
CHLOROBENZENE	12 U	57 U
CHLORODIBROMOMETHANE	12 U	57 U
CHLOROETHANE	12 U	57 U
CHLOROFORM	12 U	57 U
CHLOROMETHANE	12 U	57 U
CIS-1,3-DICHLOROPROPENE	12 U	57 U
ETHYLBENZENE	12 U	500
METHYLENE CHLORIDE	12 UJ	57 UJ
STYRENE	12 U	57 U
TETRACHLOROETHENE	12 U	57 U
TOLUENE	12 U	23 J
TOTAL 1,2-DICHLOROETHENE	12 U	57 U
TOTAL XYLENES	12 U	260 J
TRANS-1,3-DICHLOROPROPENE	12 U	57 U
TRICHLOROETHENE	12 U	57 U
VINYL CHLORIDE	12 U	57 U
Semivolatile Organics (ug/kg)		
1,2,4-TRICHLOROBENZENE	410 UJ	370 UJ
1,2-DICHLOROBENZENE	410 U	370 U
1,3-DICHLOROBENZENE	410 U	370 U
1,4-DICHLOROBENZENE	410 U	370 U
2,4,5-TRICHLOROPHENOL	1000 U	910 U

APPENDIX TABLE A-6-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014
LOCATION	TP-14-01	TP-14-02
NSAMPLE	14SS0101	14SS0202
SAMPLE	14SS0101	14SS0202
SUBMATRIX	SB	SB
SACODE	NORMAL	NORMAL
DEPTH RANGE	5 - 6	11.5 - 12.5
STATUS	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	410 U	370 U
2,4-DICHLOROPHENOL	410 U	370 U
2,4-DIMETHYLPHENOL	410 U	370 U
2,4-DINITROPHENOL	1000 UJ	910 UJ
2,4-DINITROTOLUENE	410 U	370 U
2,6-DINITROTOLUENE	410 U	370 U
2-CHLORONAPHTHALENE	410 U	370 U
2-CHLOROPHENOL	410 U	370 U
2-METHYLNAPHTHALENE	410 U	370 U
2-METHYLPHENOL	410 U	370 U
2-NITROANILINE	1000 U	910 U
2-NITROPHENOL	410 U	370 U
3,3'-DICHLOROBENZIDINE	410 UJ	370 UJ
3-NITROANILINE	1000 U	910 U
4,6-DINITRO-2-METHYLPHENOL	1000 UJ	910 UJ
4-BROMOPHENYL PHENYL ETHER	410 U	370 U
4-CHLORO-3-METHYLPHENOL	410 U	370 U
4-CHLOROANILINE	410 U	370 U
4-METHYLPHENOL	410 U	60 J
4-NITROANILINE	1000 U	910 U
4-NITROPHENOL	1000 U	910 U
ACENAPHTHENE	410 U	370 U
ACENAPHTHYLENE	410 U	370 U
ANTHRACENE	410 U	370 U
BENZO(A)ANTHRACENE	410 U	370 U
BENZO(A)PYRENE	410 U	370 U
BENZO(B)FLUORANTHENE	410 UJ	370 UJ
BENZO(G,H,I)PERYLENE	410 U	370 U
BENZO(K)FLUORANTHENE	410 U	370 U
BIS(2-CHLOROETHOXY)METHANE	410 U	370 U
BIS(2-CHLOROETHYL)ETHER	410 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	410 U	290 J
BUTYL BENZYL PHTHALATE	410 U	370 U
CHRYSENE	410 U	370 U
DI-N-BUTYL PHTHALATE	410 UJ	370 U
DI-N-OCTYL PHTHALATE	410 U	370 U
DIBENZO(A,H)ANTHRACENE	410 U	370 U
DIBENZOFURAN	410 U	370 U
DIETHYL PHTHALATE	410 U	370 U
DIMETHYL PHTHALATE	410 U	370 U

APPENDIX TABLE A-6-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014
LOCATION	TP-14-01	TP-14-02
NSAMPLE	14SS0101	14SS0202
SAMPLE	14SS0101	14SS0202
SUBMATRIX	SB	SB
SACODE	NORMAL	NORMAL
DEPTH RANGE	5 - 6	11.5 - 12.5
STATUS	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB
FLUORANTHENE	410 U	370 U
FLUORENE	410 U	370 U
HEXACHLOROBENZENE	410 U	370 U
HEXACHLOROBUTADIENE	410 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	410 U	370 U
HEXACHLOROETHANE	410 U	370 U
INDENO(1,2,3-CD)PYRENE	410 U	370 U
ISOPHORONE	410 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	410 U	370 U
N-NITROSODIPHENYLAMINE	410 U	370 U
NAPHTHALENE	410 U	1500
NITROBENZENE	410 U	370 U
PENTACHLOROPHENOL	1000 U	910 U
PHENANTHRENE	410 U	370 U
PHENOL	410 U	370 U
PYRENE	410 U	370 U
Pesticides PCBs (ug/kg)		
4,4'-DDD	4.1 U	3.7 U
4,4'-DDE	4.1 U	3.7 U
4,4'-DDT	4.1 U	3.7 U
ALDRIN	2.1 U	1.9 U
ALPHA-BHC	2.1 U	1.9 U
ALPHA-CHLORDANE	2.1 U	1.9 U
AROCLOR-1016	41 U	37 U
AROCLOR-1221	84 U	76 U
AROCLOR-1232	41 U	37 U
AROCLOR-1242	41 U	37 U
AROCLOR-1248	41 U	37 U
AROCLOR-1254	41 U	37 U
AROCLOR-1260	41 U	37 U
BETA-BHC	2.1 U	1.9 U
DELTA-BHC	2.1 U	1.9 U
DIELDRIN	4.1 U	3.7 U
ENDOSULFAN I	2.1 U	1.9 U
ENDOSULFAN II	4.1 U	3.7 U
ENDOSULFAN SULFATE	4.1 U	3.7 U
ENDRIN	4.1 U	3.7 U
ENDRIN KETONE	4.1 U	3.7 U
GAMMA-BHC (LINDANE)	2.1 U	1.9 U
GAMMA-CHLORDANE	2.1 U	1.9 U

APPENDIX TABLE A-6-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014
LOCATION	TP-14-01	TP-14-02
NSAMPLE	14SS0101	14SS0202
SAMPLE	14SS0101	14SS0202
SUBMATRIX	SB	SB
SACODE	NORMAL	NORMAL
DEPTH RANGE	5 - 6	11.5 - 12.5
STATUS	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB
HEPTACHLOR	2.1 U	1.9 U
HEPTACHLOR EPOXIDE	2.1 U	1.9 U
METHOXYCHLOR	21 U	19 U
TOXAPHENE	210 U	190 U
Inorganics (mg/kg)		
ALUMINUM	14900	8830
ANTIMONY	2.4 U	2.5 U
ARSENIC	4.5	3.7
BARIUM	7.9 J	7.7 J
BERYLLIUM	0.21 J	0.2 J
CADMIUM	0.68 U	1.7
CALCIUM	126 J	256 J
CHROMIUM	18.6	18.4
COBALT	1.8 J	1.4 J
COPPER	7.5	4.6 J
IRON	18800	15300
LEAD	7.3	5.6
MAGNESIUM	104 J	71.6 J
MANGANESE	35	23.4
MERCURY	0.12 J	0.14 J
NICKEL	3.1 J	3.6 J
POTASSIUM	153 U	158 U
SELENIUM	0.47 U	0.49 U
SILVER	0.45 U	0.5 J
SODIUM	169 J	190 J
THALLIUM	0.36 U	0.37 U
VANADIUM	47.7	38.8
ZINC	9.8 J	15.4
Miscellaneous Parameters (mg/kg)		
CYANIDE	0.09 U	0.1 U

APPENDIX TABLE A-6-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014	0014	0014	0014	0014	0014	0014
LOCATION	14-SL-01	14-SL-02	14-SL-03	14S-001	14S-001	14S-001	14S-002	14S-003
NSAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101-D	14S00201	14S00301
SAMPLE	14-SL-01	14-SL-02	14-SL-03	14S00101	14S00101-AVG	14S00101D	14S00201	14S00301
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	12/8/1995	12/8/1995	12/8/1995	12/8/1995	12/8/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)								
METHYLENE CHLORIDE	6 UJ	6 UJ	6 UJ	6 J	6 J	12 U	11 U	8 J
TOTAL XYLENES	2 J	6 U	5 U	11 U	11.5 UJ	12 UJ	11 U	11 U
Semivolatile Organics (ug/kg)								
4-METHYLPHENOL	370 U	380 U	350 U	380 U	380 U	380 U	370 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	40 J	350 U	380 U	380 U	380 U	370 U	370 U
CHRYSENE	370 UJ	380 J	350 UJ	380 U	380 U	380 U	370 U	370 U
Inorganics (mg/kg)								
ALUMINUM	20400	13500	11800	11600	11550	11500	23800	10100
ARSENIC	4.2	2.2 J	1.8 J	1.5 J	1.7 J	1.9 J	4.3	1.7 J
BARIUM	12 J	6.2 J	17.1 J	23.3 J	24.95 J	26.6 J	11.9 J	14.9 J
BERYLLIUM	0.15 J	0.13 J	0.12 J	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	0.61 U	0.94 J	0.59 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	118 J	80.9 J	110 J	120 J	151.5 J	183 J	56.6 J	51.9 J
CHROMIUM	17	17.6	7.2	7.8	7.8	7.8	19.6	5.9
COBALT	1.5 J	1.5 J	1.8 J	1.8 J	1.7 J	1.6 J	0.65 J	1.3 J
COPPER	4.9 J	5.1 J	7.8	5 UJ	5 UJ	5 UJ	5 U	5 UJ
IRON	14300	15800	7120	6310	6470	6630	15500	5470
LEAD	5.7 J	5.1 J	4.3 J	7.7 J	9.8 J	11.9 J	6.2 J	5.3 J
MAGNESIUM	87.4 J	48.6 J	106 J	177 J	169.5 J	162 J	142 J	122 J
MANGANESE	62.3	33.6	113	521 J	559 J	597 J	43.6 J	313 J
MERCURY	0.08 U	0.09 U	0.08 U	0.04 J	0.04 J	0.04 J	0.02 J	0.04 J
NICKEL	2.4 U	2.4 U	2.3 U	4.1 J	4.35 J	4.6 J	5 J	3.5 J
POTASSIUM	133 U	137 U	129 U	144 J	144 J	1000 U	174 J	1000 U
SODIUM	170 J	179 J	180 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
VANADIUM	37.4	42.1	16.9	16.8	17.1	17.4	41.1	14.1
ZINC	7.7 J	11.1	7.8 J	4 U	4 U	4 U	4 U	4 UJ
Miscellaneous Parameters (mg/kg)								
CYANIDE	0.24 U	0.25 U	0.24 U	0.07 J	0.07 J	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-6-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014
LOCATION	TP-14-01	TP-14-02
NSAMPLE	14SS0101	14SS0202
SAMPLE	14SS0101	14SS0202
SUBMATRIX	SB	SB
SACODE	NORMAL	NORMAL
DEPTH RANGE	5 - 6	11.5 - 12.5
STATUS	NORMAL	NORMAL
SAMPLE DATE	10/8/1992	10/8/1992
COLLECTION METHOD	GRAB	GRAB
Volatile Organics (ug/kg)		
ACETONE	72 UJ	170 J
ETHYLBENZENE	12 U	500
TOLUENE	12 U	23 J
TOTAL XYLENES	12 U	260 J
Semivolatile Organics (ug/kg)		
4-METHYLPHENOL	410 U	60 J
BIS(2-ETHYLHEXYL)PHTHALATE	410 U	290 J
NAPHTHALENE	410 U	1500
Inorganics (mg/kg)		
ALUMINUM	14900	8830
ARSENIC	4.5	3.7
BARIUM	7.9 J	7.7 J
BERYLLIUM	0.21 J	0.2 J
CADMIUM	0.68 U	1.7
CALCIUM	126 J	256 J
CHROMIUM	18.6	18.4
COBALT	1.8 J	1.4 J
COPPER	7.5	4.6 J
IRON	18800	15300
LEAD	7.3	5.6
MAGNESIUM	104 J	71.6 J
MANGANESE	35	23.4
MERCURY	0.12 J	0.14 J
NICKEL	3.1 J	3.6 J
SILVER	0.45 U	0.5 J
SODIUM	169 J	190 J
VANADIUM	47.7	38.8
ZINC	9.8 J	15.4

APPENDIX TABLE A-6-5
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
METHYLENE CHLORIDE	2/6	6 J	8 J	6 - 12	4.75	7.00	14S00301
TOTAL XYLENES	1/6	2 J	2 J	5 - 12	4.04	2.00	14-SL-01
Semivolatile Organics (ug/kg)							
BIS(2-ETHYLHEXYL)PHTHALATE	1/6	40 J	40 J	350 - 380	160	40.0	14-SL-02
CHRYSENE	1/6	380 J	380 J	350 - 380	217	380	14-SL-02
Inorganics (mg/kg)							
ALUMINUM	6/6	10100	23800	---	15192	15192	14S00201
ARSENIC	6/6	1.5 J	4.3	---	2.65	2.65	14S00201
BARIUM	6/6	6.2 J	26.6 J	---	14.5	14.5	14S00101-D
BERYLLIUM	3/6	0.12 J	0.15 J	1	0.317	0.133	14-SL-01
CADMIUM	1/6	0.94 J	0.94 J	0.59 - 1	0.507	0.940	14-SL-02
CALCIUM	6/6	51.9 J	183 J	---	94.8	94.8	14S00101-D
CHROMIUM	6/6	5.9	19.6	---	12.5	12.5	14S00201
COBALT	6/6	0.65 J	1.8 J	---	1.41	1.41	14-SL-03, 14S00101
COPPER	3/6	4.9 J	7.8	5	4.22	5.93	14-SL-03
IRON	6/6	5470	15800	---	10777	10777	14-SL-02
LEAD	6/6	4.3 J	11.9 J	---	6.07	6.07	14S00101-D
MAGNESIUM	6/6	48.6 J	177 J	---	113	113	14S00101
MANGANESE	6/6	33.6	597 J	---	187	187	14S00101-D
MERCURY	3/6	0.02 J	0.04 J	0.08 - 0.09	0.0375	0.0333	14S00101, 14S00101-D, 14S00301
NICKEL	3/6	3.5 J	5 J	2.3 - 2.4	2.73	4.28	14S00201
POTASSIUM	2/6	144 J	174 J	129 - 1000	170	159	14S00201
SODIUM	3/6	170 J	180 J	1000	338	176	14-SL-03
VANADIUM	6/6	14.1	42.1	---	28.1	28.1	14-SL-02
ZINC	3/6	7.7 J	11.1	4	5.43	8.87	14-SL-02
Miscellaneous Parameter (mg/kg)							
CYANIDE	1/6	0.07 J	0.07 J	0.24 - 0.5	0.156	0.0700	14S00101

APPENDIX TABLE A-6-6
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
ACETONE	1/2	170 J	170 J	72	103	170	14SS0202
ETHYLBENZENE	1/2	500	500	12	253	500	14SS0202
TOLUENE	1/2	23 J	23 J	12	14.5	23.0	14SS0202
TOTAL XYLENES	1/2	260 J	260 J	12	133	260	14SS0202
Semivolatile Organics (ug/kg)							
4-METHYLPHENOL	1/2	60 J	60 J	410	133	60.0	14SS0202
BIS(2-ETHYLHEXYL)PHTHALATE	1/2	290 J	290 J	410	248	290	14SS0202
NAPHTHALENE	1/2	1500	1500	410	853	1500	14SS0202
Inorganics (mg/kg)							
ALUMINUM	2/2	8830	14900	---	11865	11865	14SS0101
ARSENIC	2/2	3.7	4.5	---	4.10	4.10	14SS0101
BARIUM	2/2	7.7 J	7.9 J	---	7.80	7.80	14SS0101
BERYLLIUM	2/2	0.2 J	0.21 J	---	0.205	0.205	14SS0101
CADMIUM	1/2	1.7	1.7	0.68	1.02	1.70	14SS0202
CALCIUM	2/2	126 J	256 J	---	191	191	14SS0202
CHROMIUM	2/2	18.4	18.6	---	18.5	18.5	14SS0101
COBALT	2/2	1.4 J	1.8 J	---	1.60	1.60	14SS0101
COPPER	2/2	4.6 J	7.5	---	6.05	6.05	14SS0101
IRON	2/2	15300	18800	---	17050	17050	14SS0101
LEAD	2/2	5.6	7.3	---	6.45	6.45	14SS0101
MAGNESIUM	2/2	71.6 J	104 J	---	87.8	87.8	14SS0101
MANGANESE	2/2	23.4	35	---	29.2	29.2	14SS0101
MERCURY	2/2	0.12 J	0.14 J	---	0.130	0.130	14SS0202
NICKEL	2/2	3.1 J	3.6 J	---	3.35	3.35	14SS0202
SILVER	1/2	0.5 J	0.5 J	0.45	0.363	0.500	14SS0202
SODIUM	2/2	169 J	190 J	---	180	180	14SS0202
VANADIUM	2/2	38.8	47.7	---	43.3	43.3	14SS0101
ZINC	2/2	9.8 J	15.4	---	12.6	12.6	14SS0202

APPENDIX TABLE A-6-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
METHYLENE CHLORIDE	**6**	**2**	**6**	**8.00**	**4.75**	**7.00**	**2.09**	**0.676**	**Normal**	**6.47**	**Student-t**	**Max ND > UCL**
TOTAL XYLENES	**6**	**1**	**2**	**2.00**	**4.04**	**2.00**	**1.72**	**-0.125**	**Normal**	**5.46**	**Student-t**	**UCL > Max**
BIS(2-ETHYLHEXYL)PHTHALATE	**6**	**1**	**40**	**40.0**	**160**	**40.0**	**59.0**	**-2.412**	**Non-parametric**	**265**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max**
CHRYSENE	**6**	**1**	**380**	**380**	**217**	**380**	**80.2**	**2.43**	**Non-parametric**	**283**	**Student-t or Modified-t UCL**	**Max ND > UCL**
ALUMINUM	6	6	10100	23800	15192	15192	5564	0.967	Normal	19769	Student-t	- -
ARSENIC	6	6	1.7	4.30	2.65	2.65	1.25	0.883	Gamma	4.07	Approximate Gamma 95% UCL	- -
BARIUM	6	6	6.2	25.0	14.5	14.5	6.29	0.661	Normal	19.7	Student-t	- -
BERYLLIUM	6	3	0.12	0.150	0.317	0.133	0.201	-0.009	Non-parametric	0.674	95% Chebyshev(Mean, Std) UCL	UCL > Max
CADMIUM	**6**	**1**	**0.94**	**0.940**	**0.507**	**0.940**	**0.234**	**1.49**	**Normal**	**0.699**	**Student-t**	**Max ND > UCL**
CALCIUM	6	6	51.9	152	94.8	94.8	38.7	0.314	Normal	127	Student-t	- -
CHROMIUM	6	6	5.9	19.6	12.5	12.5	6.17	0.041	Normal	17.6	Student-t	- -
COBALT	6	6	0.65	1.80	1.41	1.41	0.410	-1.523	Normal	1.75	Student-t	- -
COPPER	6	3	4.9	7.80	4.22	5.93	2.14	0.973	Normal	5.98	Student-t	- -
IRON	6	6	5470	15800	10777	10777	4900	-0.006	Normal	14807	Student-t	- -
LEAD	6	6	4.3	9.80	6.07	6.07	1.94	1.87	Normal	7.66	Student-t	- -
MAGNESIUM	6	6	48.6	170	113	113	42.3	-0.267	Normal	147	Student-t	- -
MANGANESE	6	6	33.6	559	187	187	209	1.45	Normal	360	Student-t	- -
MERCURY	6	3	0.02	0.040	0.038	0.033	0.009	-2.144	Non-parametric	0.045	Student-t or Modified-t UCL	UCL > Max
NICKEL	6	3	3.5	5.00	2.73	4.28	1.76	0.281	Normal	4.18	Student-t	- -
POTASSIUM	**6**	**2**	**144**	**174**	**170**	**159**	**168**	**2.06**	**Gamma**	**392**	**Approximate Gamma 95% UCL**	**UCL > Max**
SODIUM	6	3	170	180	338	176	177	-0.002	Non-parametric	654	95% Chebyshev(Mean, Std) UCL	UCL > Max
VANADIUM	6	6	14.1	42.1	28.1	28.1	13.4	0.028	Normal	39.1	Student-t	- -
ZINC	6	3	7.7	11.1	5.43	8.87	3.96	0.414	Normal	8.69	Student-t	- -
CYANIDE	**6**	**1**	**0.07**	**0.070**	**0.156**	**0.070**	**0.076**	**0.635**	**Normal**	**0.218**	**Student-t**	**UCL > Max**

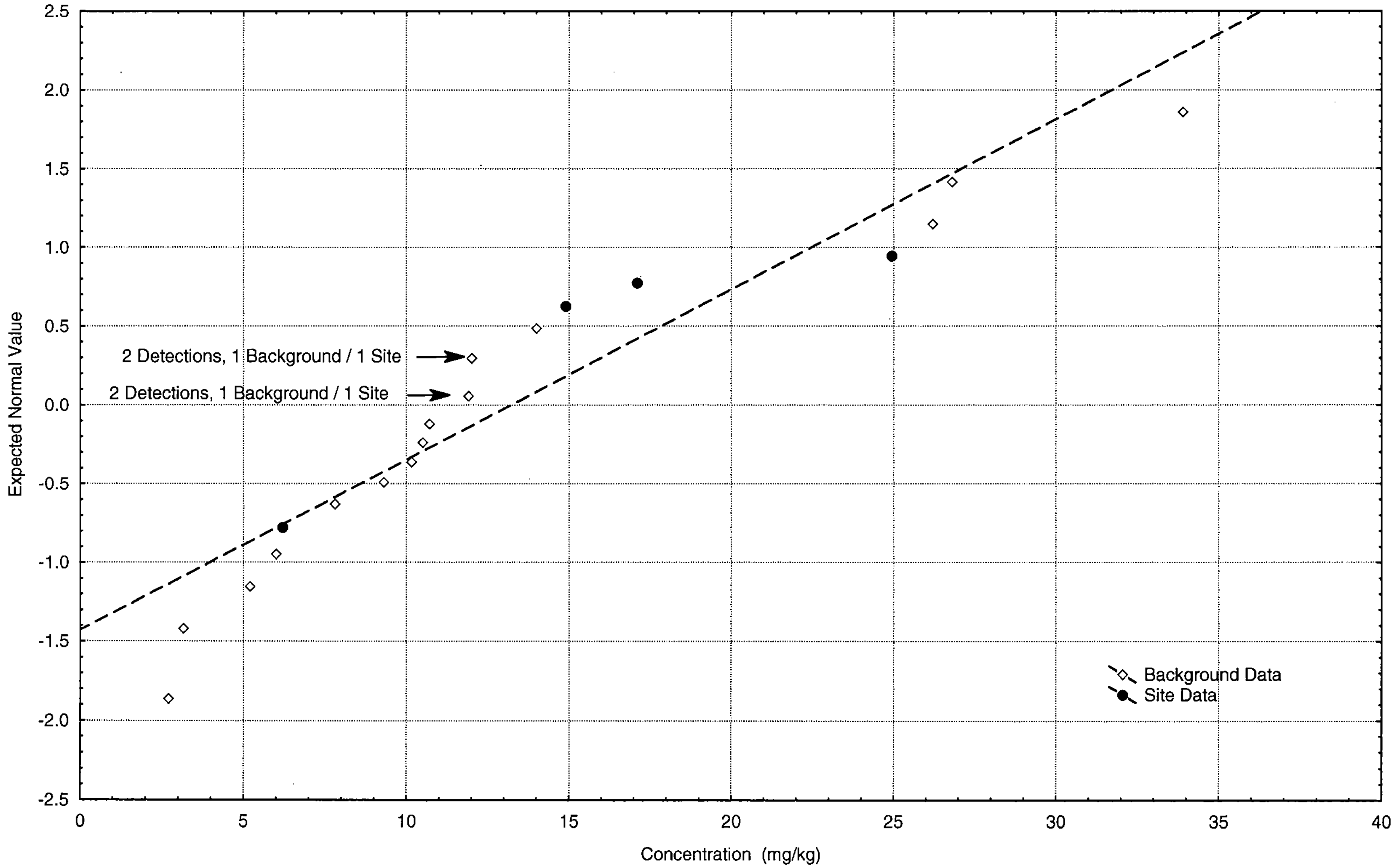
Bolded shaded values indicate that frequency of detection is less than 50 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
N/R - Bootstrap statistics can not be calculated because there are less than five unique samples.
B qualified data were evaluated as positive detections.

Associated Samples
14-SL-01
14-SL-02
14-SL-03
14S00101-AVG
14S00201
14S00301

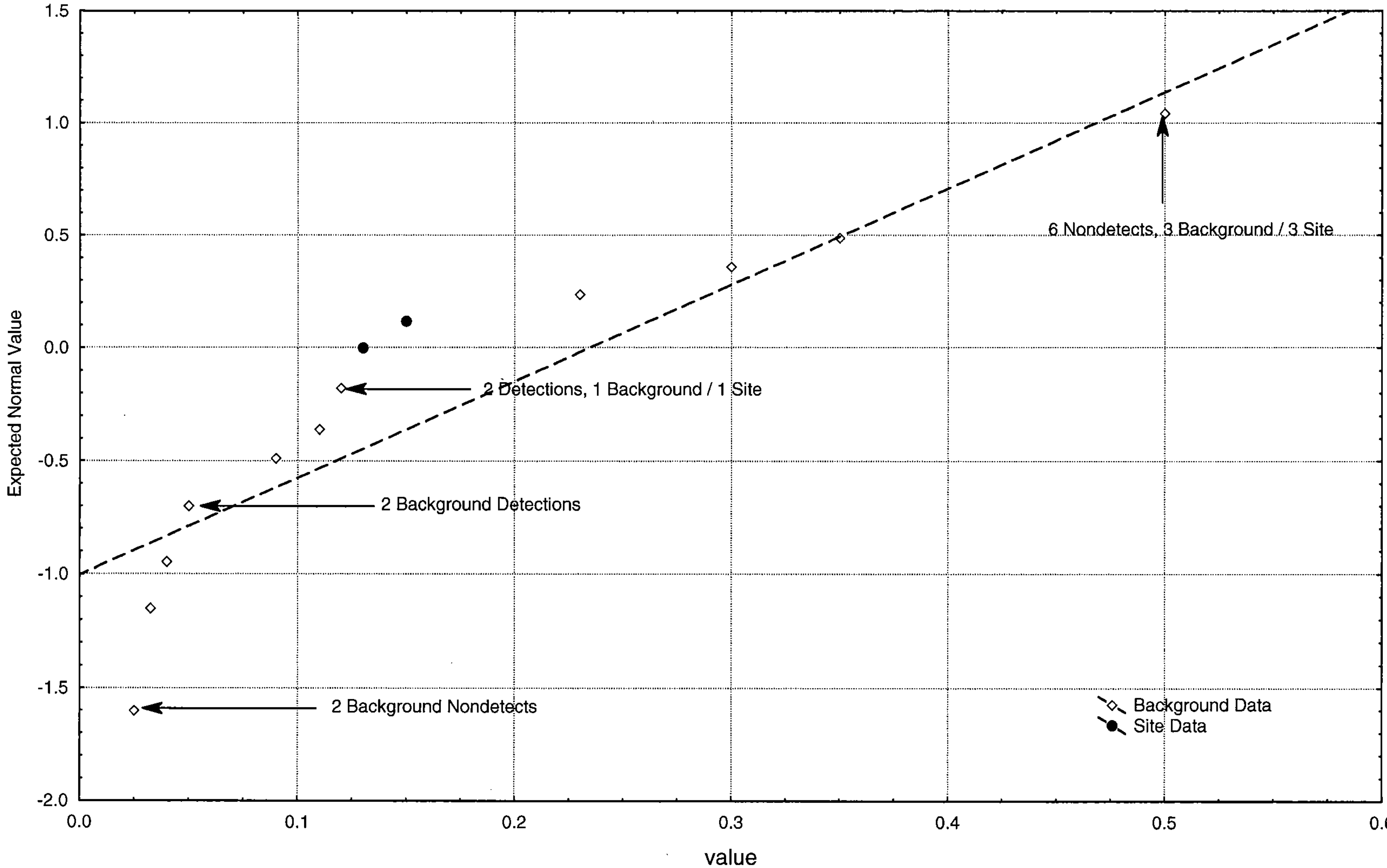
APPENDIX TABLE A-6-8
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 14 SURFACE SOIL																			
CADMIUM	1/6	3/15	4/21	81%	**FAIL**	0.94 J	0.9 J	0.507	0.395	---	---	---	---	Proportions	0.705	0.240	NO	PASS	NO
COPPER	3/6	12/15	15/21	29%	PASS	7.8	8.5	4.22	3.97	NORMAL	LOGNORMAL	**FAIL**	---	WRS	-0.0394	0.969	NO	PASS	NO
LEAD	6/6	15/15	21/21	0%	PASS	9.8 J	9.8 J	6.07	5.49	NORMAL	NORMAL	PASS	PASS	Student's T	0.297	0.592	NO	PASS	NO
MERCURY	3/6	**5/15**	8/21	62%	**FAIL**	0.04 J	0.07 J	0.0375	0.0355	---	---	---	---	Proportions	-0.940	0.174	NO	PASS	NO
NICKEL	3/6	**6/15**	9/21	57%	**FAIL**	5 J	5.9 J	2.73	2.65	---	---	---	---	Proportions	1.05	0.146	NO	PASS	NO

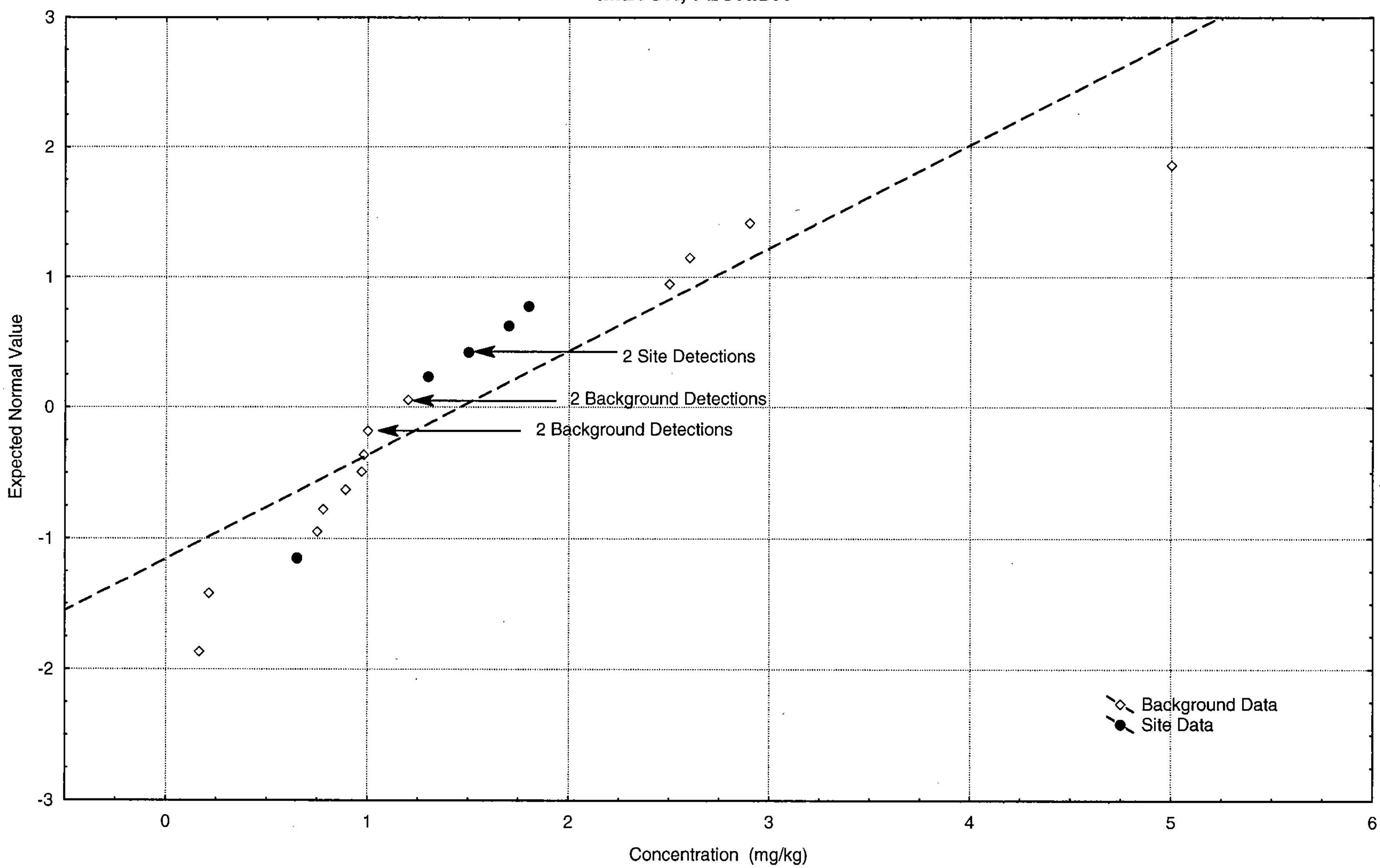
APPENDIX FIGURE A-6-1
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



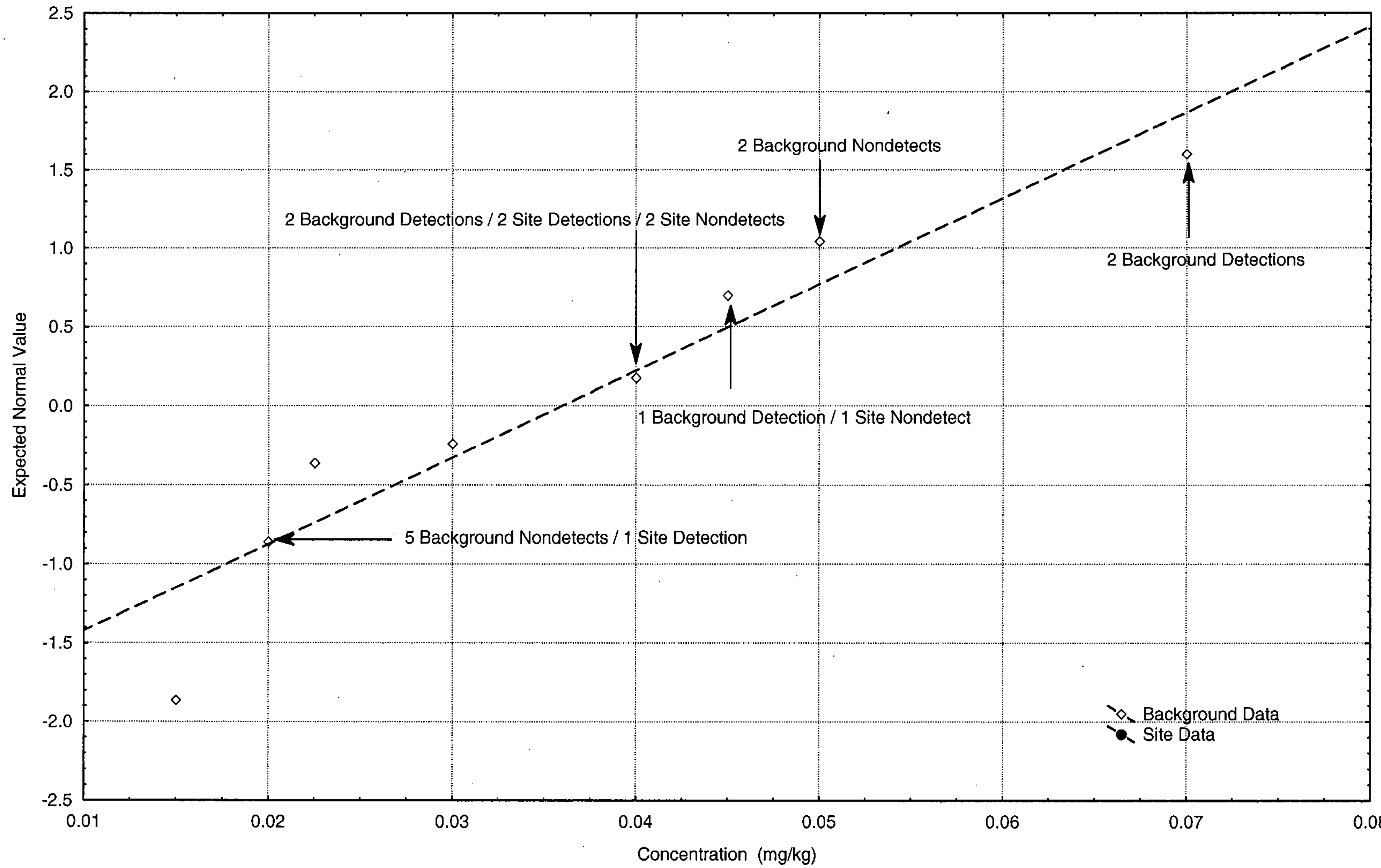
APPENDIX FIGURE A-6-2
NORMAL PROBABILITY PLOT - BERYLLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



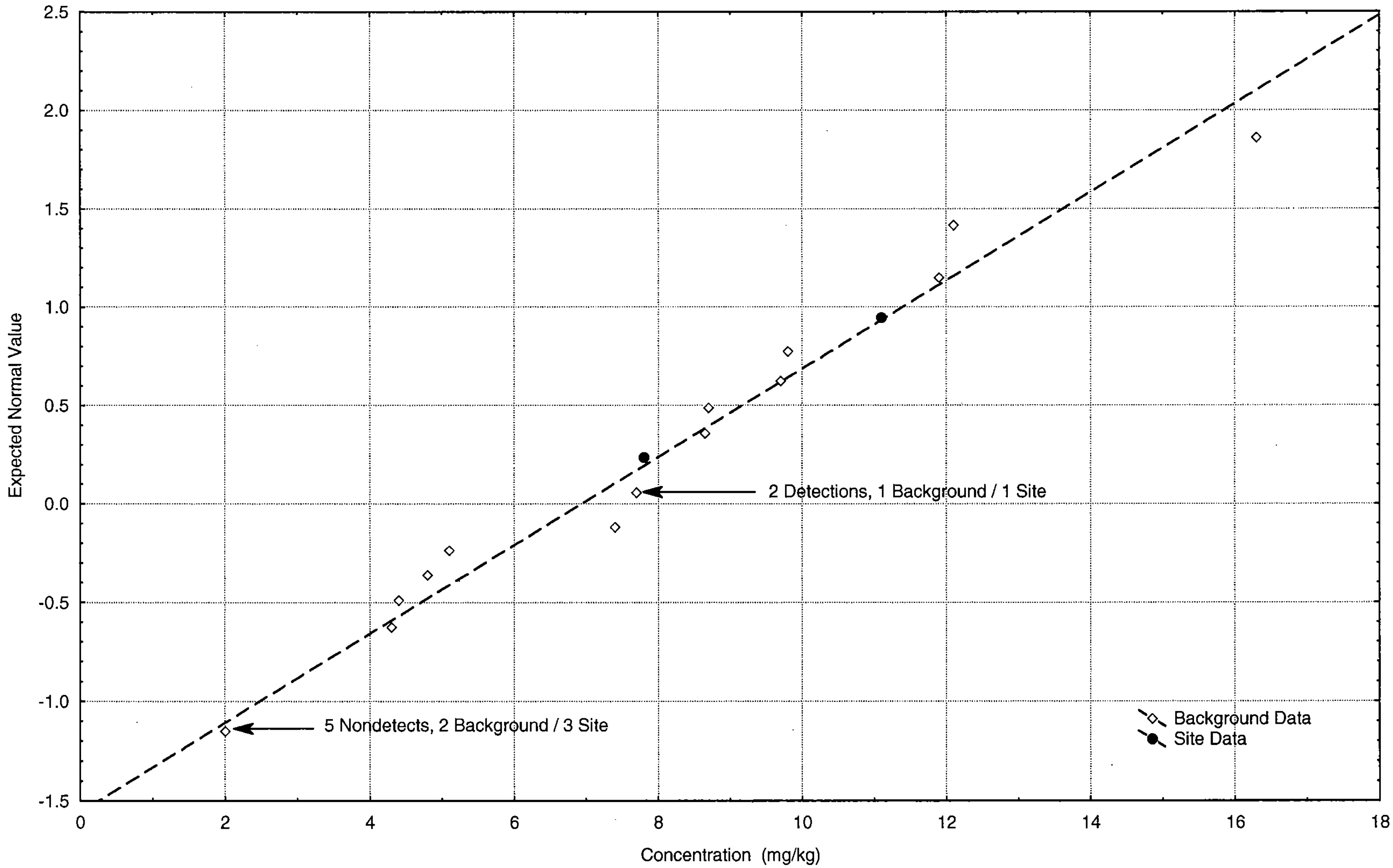
APPENDIX FIGURE A-6-3
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-6-4
NORMAL PROBABILITY PLOT - MERCURY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-6-5
NORMAL PROBABILITY PLOT - ZINC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 14, SHORT-TERM SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.7

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 15, SOUTHWEST LANDFILL

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	15	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15-S001	15-S001	15-S001	15-S002	15-S003	15-S004	15-S005	15-S006
NSAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101-D	15S00201	15S00301	15S00401	15S00501	15S00601
SAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101D	15S00201	15S00301	15S00401	15S00501	15S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	8/11/1992	8/11/1992	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)													
1,1,1-TRICHLOROETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,1,2-TRICHLOROETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,1-DICHLOROETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,1-DICHLOROETHENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,2-DICHLOROETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
1,2-DICHLOROPROPANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
2-HEXANONE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
ACETONE	11 UJ	11 U	11 U	11 U	13 U	11 U	11 U	11 U	13 U	11 U	11 U	10 U	11 U
BENZENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
BROMODICHLOROMETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
BROMOFORM	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CARBON DISULFIDE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CARBON TETRACHLORIDE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CHLOROBENZENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CHLORODIBROMOMETHANE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CHLOROFORM	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
ETHYLBENZENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
METHYLENE CHLORIDE	5 UJ	5 UJ	7 UJ	6 UJ	7 UJ	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
STYRENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TETRACHLOROETHENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TOLUENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TOTAL 1,2-DICHLOROETHENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TOTAL XYLENES	5 U	1 J	2 J	4 J	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TRICHLOROETHENE	5 U	5 U	6 U	5 U	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
VINYL ACETATE	11 U	11 U	11 U	11 U	13 U								
VINYL CHLORIDE	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Semivolatile Organics (ug/kg)													
1,2,4-TRICHLOROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 R	360 U	430 U	370 U	360 U
1,2-DICHLOROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
1,3-DICHLOROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
1,4-DICHLOROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 R	360 U	430 U	370 U	360 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	15	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15-S001	15-S001	15-S001	15-S002	15-S003	15-S004	15-S005	15-S006
NSAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101-D	15S00201	15S00301	15S00401	15S00501	15S00601
SAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101D	15S00201	15S00301	15S00401	15S00501	15S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	8/11/1992	8/11/1992	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1700 U	1700 U	1800 U	1700 U	1700 U	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
2,4,6-TRICHLOROPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2,4-DICHLOROPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2,4-DIMETHYLPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2,4-DINITROPHENOL	1700 U	1700 U	1800 U	1700 U	1700 U	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
2,4-DINITROTOLUENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2,6-DINITROTOLUENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2-CHLORONAPHTHALENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2-CHLOROPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2-METHYLNAPHTHALENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2-METHYLPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
2-NITROANILINE	1700 UJ	1700 UJ	1800 UJ	1700 UJ	1700 UJ	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
2-NITROPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
3,3'-DICHLOROBENZIDINE	720 U	710 U	730 U	710 U	700 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
3-NITROANILINE	1700 UJ	1700 UJ	1800 UJ	1700 UJ	1700 UJ	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
4,6-DINITRO-2-METHYLPHENOL	1700 U	1700 U	1800 U	1700 U	1700 U	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
4-BROMOPHENYL PHENYL ETHER	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
4-CHLORO-3-METHYLPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
4-CHLOROANILINE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
4-METHYLPHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
4-NITROANILINE	1700 UJ	1700 UJ	1800 UJ	1700 UJ	1700 UJ	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
4-NITROPHENOL	1700 UJ	1700 UJ	1800 UJ	1700 UJ	1700 UJ	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
ACENAPHTHENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 R	360 U	430 U	370 U	360 U
ACENAPHTHYLENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
ANTHRACENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZO(A)ANTHRACENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZO(A)PYRENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZO(B)FLUORANTHENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZO(G,H,I)PERYLENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZO(K)FLUORANTHENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BENZOIC ACID	1700 U	1700 U	1800 U	1700 U	1700 U								
BENZYL ALCOHOL	360 U	350 U	370 U	350 U	350 U								
BIS(2-CHLOROETHOXY)METHANE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BIS(2-CHLOROETHYL)ETHER	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	39 J	350 U	41 J	350 U	350 U	390 U	947.5	1700	370 U	360 U	430 U	370 U	360 U
BUTYL BENZYL PHTHALATE	360 UJ	350 UJ	370 UJ	350 UJ	350 UJ	390 U	375 U	360 U	240 J	360 U	430 U	370 U	360 U
CHRYSENE	360 UJ	350 UJ	370 UJ	350 UJ	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
DI-N-BUTYL PHTHALATE	360 UJ	350 UJ	370 UJ	350 UJ	350 U	390 U	375 U	360 U	1100	790	730	770	850
DI-N-OCTYL PHTHALATE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
DIBENZO(A,H)ANTHRACENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	15	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15-S001	15-S001	15-S001	15-S002	15-S003	15-S004	15-S005	15-S006
NSAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101-D	15S00201	15S00301	15S00401	15S00501	15S00601
SAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101D	15S00201	15S00301	15S00401	15S00501	15S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	8/11/1992	8/11/1992	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
DIETHYL PHTHALATE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
DIMETHYL PHTHALATE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
FLUORANTHENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
FLUORENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
HEXACHLOROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
HEXACHLOROBUTADIENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
HEXACHLOROCYCLOPENTADIENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
HEXACHLOROETHANE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
INDENO(1,2,3-CD)PYRENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
ISOPHORONE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
N-NITROSODIPHENYLAMINE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
NAPHTHALENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
NITROBENZENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
PENTACHLOROPHENOL	1700 U	1700 U	1800 U	1700 U	1700 U	970 U	935 U	900 U	920 U	900 U	1100 U	920 U	900 U
PHENANTHRENE	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
PHENOL	360 U	350 U	370 U	350 U	350 U	390 U	375 U	360 U	370 U	360 U	430 U	370 U	360 U
PYRENE	360 UJ	350 UJ	370 UJ	350 UJ	350 UJ	390 U	375 U	360 U	370 R	360 U	430 U	370 U	360 U
Pesticides PCBs (ug/kg)													
4,4'-DDD	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
4,4'-DDE	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
4,4'-DDT	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
ALDRIN	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
ALPHA-BHC	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	1.8 UJ
ALPHA-CHLORDANE	87 U	86 U	89 U	86 U	85 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
AROCLOR-1016	87 U	86 U	89 U	86 U	85 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
AROCLOR-1221	87 U	86 U	89 U	86 U	85 U	73 U	73 U	73 U	74 U	74 U	74 U	73 U	73 U
AROCLOR-1232	87 U	86 U	89 U	86 U	85 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
AROCLOR-1242	87 U	86 U	89 U	86 U	85 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
AROCLOR-1248	87 U	86 U	89 U	86 U	85 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
AROCLOR-1254	170 U	170 U	180 U	170 U	170 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
AROCLOR-1260	170 U	170 U	180 U	170 U	170 U	36 U	36 U	36 U	36 U	37 U	36 U	36 U	36 U
BETA-BHC	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
DELTA-BHC	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
DIELDRIN	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
ENDOSULFAN I	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
ENDOSULFAN II	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
ENDOSULFAN SULFATE	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
ENDRIN	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	15	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15-S001	15-S001	15-S001	15-S002	15-S003	15-S004	15-S005	15-S006
NSAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101-D	15S00201	15S00301	15S00401	15S00501	15S00601
SAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101D	15S00201	15S00301	15S00401	15S00501	15S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	8/11/1992	8/11/1992	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
GAMMA-BHC (LINDANE)	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
GAMMA-CHLORDANE	87 U	86 U	89 U	86 U	85 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
HEPTACHLOR	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
HEPTACHLOR EPOXIDE	8.7 U	8.6 U	8.9 U	8.6 U	8.5 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U
METHOXYCHLOR	87 U	86 U	89 U	86 U	85 U	18 U	18 U	18 U	19 U	19 U	19 U	18 U	18 U
TOXAPHENE	170 U	170 U	180 U	170 U	170 U	180 U	180 U	180 U	190 U	190 U	190 U	180 U	180 U
Inorganics (mg/kg)													
ALUMINUM	11800	5160	7450	6790	4940	9280	10040	10800	6210	10200	12400	5290	11900
ANTIMONY	2.7 U	2.6 U	2.7 U	2.7 U	2.6 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	1.6 J	0.93 J	2.2 J	1 J	0.98 J	2 J	1.95 J	1.9 J	1.3 J	2 J	2.7	1.2 J	2.1 J
BARIUM	5.3 J	7 J	4.3 J	9 J	3.2 J	6.6 J	7.2 J	7.8 J	4.7 J	6.9 J	7.4 J	5.5 J	7.3 J
BERYLLIUM	0.07 J	0.05 U	0.08 J	0.09 J	0.05 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	0.59 U	0.59 U	0.61 U	0.59 U	0.58 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	75.6 J	137 J	79.6 J	78.9 J	136 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
CHROMIUM	10.8	3.3	6.3	3.9	3.8	8.4	8.2	8	8.1	6.9	9.1	4.6	8.5
COBALT	1.2 J	0.73 J	0.85 J	1 J	0.33 U	10 U	10 U	10 U	10 U	10 U	10 U	0.55 J	0.49 J
COPPER	4.1 J	4.2 J	1.6 J	5.1 J	12.5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
IRON	7760	3040	4980	3460	2810	5120	5410	5700	3760	5100	6570	3490	6400
LEAD	2.8 J	4.4 J	4.4 J	10.7 J	59.9	4.7	4.15	3.6	2.8	6	3.6	3.2	5.5
MAGNESIUM	54.3 J	74.3 J	43 J	93.9 J	57.8 J	109 J	120.5 J	132 J	72.2 J	133 J	121 J	84.9 J	135 J
MANGANESE	23.1	25.7	9.3	143	13.7	36.4	38.15	39.9	35.7	12.9	34.4	43.3	30.8
MERCURY	0.06 U	0.07 U	0.08 U	0.08 U	0.07 U	0.02 J	0.02 J	0.02 J	0.01 J	0.01 J	0.01 J	0.01 J	0.01 J
NICKEL	2.3 U	2.3 U	2.4 U	2.3 U	2.3 U	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ
POTASSIUM	130 U	129 U	133 U	130 U	128 U	169 J	169 J	1000 U	1000 U	131	1000 U	1000 U	1000 U
SELENIUM	0.4 U	0.4 U	0.41 U	0.4 U	0.39 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SILVER	0.32 U	0.32 U	0.33 U	0.32 U	0.32 U	2 U	2 U	2 U	0.74 J	2 U	2 U	0.66 J	2 U
SODIUM	170 J	174 J	172 J	174 J	179 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
THALLIUM	0.44 U	0.44 U	0.45 U	0.44 U	0.44 U	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
VANADIUM	20.6	6.8 J	12.6	8.3 J	7.2 J	13.3	14.2	15.1	9.6 J	14.5	17.8	7.5 J	17
ZINC	11.3	6.8 J	5.4 J	7.4 J	8.8	4.1 J	4.55 J	5	2.8 J	6.3	4.9	3.7 J	7.1
Miscellaneous Parameters (mg/kg)													
CYANIDE	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S007	15-S008	15-S009	15-S010	15-S011	15-S012	15-S013	15-S014	15-S016	15-S017	15-S017	15-S017
NSAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701-D
SAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/11/1995	12/11/1995	12/11/1995	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/10/1995	12/10/1995	12/10/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
2-BUTANONE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
2-HEXANONE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
ACETONE	11 U	11 U	11 U	22 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BENZENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOFORM	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOMETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLORODIBROMOMETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
ETHYLBENZENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	11 U	11 U	11 U	12 U	3 J	4 J	11 U	11 U	11 U	11 U	11 U	11 U
STYRENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TETRACHLOROETHENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOLUENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL XYLENES	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TRICHLOROETHENE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
VINYL ACETATE												
VINYL CHLORIDE	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
1,2-DICHLOROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
1,3-DICHLOROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
1,4-DICHLOROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S007	15-S008	15-S009	15-S010	15-S011	15-S012	15-S013	15-S014	15-S016	15-S017	15-S017	15-S017
NSAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701-D
SAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/11/1995	12/11/1995	12/11/1995	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/10/1995	12/10/1995	12/10/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
2,4,6-TRICHLOROPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2,4-DICHLOROPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2,4-DIMETHYLPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2,4-DINITROPHENOL	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
2,4-DINITROTOLUENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2,6-DINITROTOLUENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2-CHLORONAPHTHALENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2-CHLOROPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2-METHYLNAPHTHALENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2-METHYLPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
2-NITROANILINE	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
2-NITROPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
3,3'-DICHLOROBENZIDINE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
3-NITROANILINE	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
4,6-DINITRO-2-METHYLPHENOL	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
4-BROMOPHENYL PHENYL ETHER	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
4-CHLORO-3-METHYLPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
4-CHLOROANILINE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
4-METHYLPHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
4-NITROANILINE	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
4-NITROPHENOL	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
ACENAPHTHENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
ACENAPHTHYLENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
ANTHRACENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZO(A)ANTHRACENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZO(A)PYRENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZO(B)FLUORANTHENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZO(G,H,I)PERYLENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZO(K)FLUORANTHENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BIS(2-CHLOROETHYL)ETHER	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	170 J	360 U	380 U	380 U	380 U
BUTYL BENZYL PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
CHRYSENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
DI-N-BUTYL PHTHALATE	560	370 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
DI-N-OCTYL PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
DIBENZO(A,H)ANTHRACENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S007	15-S008	15-S009	15-S010	15-S011	15-S012	15-S013	15-S014	15-S016	15-S017	15-S017	15-S017
NSAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701-D
SAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/11/1995	12/11/1995	12/11/1995	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/10/1995	12/10/1995	12/10/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
DIETHYL PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
DIMETHYL PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
FLUORANTHENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
FLUORENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
HEXACHLOROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U		380 U	380 U	380 U
HEXACHLOROBUTADIENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
HEXACHLOROCYCLOPENTADIENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
HEXACHLOROETHANE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
INDENO(1,2,3-CD)PYRENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
ISOPHORONE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
N-NITROSODIPHENYLAMINE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
NAPHTHALENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
NITROBENZENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
PENTACHLOROPHENOL	900 U	900 U	920 UJ	1000 U	900 U	900 U	920 U	900 U	900 U	950 U	950 U	950 U
PHENANTHRENE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
PHENOL	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
PYRENE	360 U	360 U		410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U	380 U
Pesticides PCBs (ug/kg)												
4,4'-DDD	3.5 U	3.6 U	3.9 U	4 U	3.8	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
4,4'-DDE	3.5 U	3.6 U	3.9 U	3.1 J	50	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
4,4'-DDT	3.5 U	3.6 U	3.9 U	4 U	14	3.6 U	4.4	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
ALDRIN	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
ALPHA-BHC	1.8 UJ	1.8 UJ	2 UJ	2.1 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ
ALPHA-CHLORDANE	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
AROCLOR-1016	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
AROCLOR-1221	72 U	73 U	80 U	82 U	72 U	73 U	73 U	73 U	73 U	76 U	76 U	76 U
AROCLOR-1232	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
AROCLOR-1242	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
AROCLOR-1248	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
AROCLOR-1254	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
AROCLOR-1260	35 U	36 U	39 U	40 U	35 U	36 U	36 U	36 U	36 U	37 U	37 U	37 U
BETA-BHC	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
DELTA-BHC	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
DIELDRIN	3.5 U	3.6 U	3.9 U	4 U	3.5 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
ENDOSULFAN I	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II	3.5 U	3.6 U	3.9 U	4 U	3.5 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
ENDOSULFAN SULFATE	3.5 U	3.6 U	3.9 U	4 U	3.5 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
ENDRIN	3.5 U	3.6 U	3.9 U	4 U	3.5 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S007	15-S008	15-S009	15-S010	15-S011	15-S012	15-S013	15-S014	15-S016	15-S017	15-S017	15-S017
NSAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701-D
SAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG	15S01701D
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/11/1995	12/11/1995	12/11/1995	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/10/1995	12/10/1995	12/10/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	3.5 U	3.6 U	3.9 U	4 U	3.5 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U	3.7 U
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	2 U	2.1 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR	18 U	18 U	20 U	21 U	18 U	18 U	18 U	18 U	18 U	19 U	19 U	19 U
TOXAPHENE	180 U	180 U	200 U	210 U	180 U	180 U	180 U	180 U	180 U	190 U	190 U	190 U
Inorganics (mg/kg)												
ALUMINUM	5590	10200	8400	5810	5060	4190	5860	6220	7190	13700	11495	9290
ANTIMONY	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	1 J	1.8 J	1.7 J	1.5 J	0.75 J	0.84 J	1.6 J	1.5 J	1.5 J	3.7	4	4.3
BARIUM	8.1 J	9.2 J	9.4 J	6.5 J	7.4 J	11.4 J	5.5 J	7 J	4.9 J	4.4 J	4.1 J	3.8 J
BERYLLIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	1000 UJ	89 J	1000 UJ	1000 UJ	1000 UJ	115 J	29.3 J	23.3 J	25.1 J	23.7 J	22.05 J	20.4 J
CHROMIUM	5.8	8.8	6.1	5.2	3.7	4.7	4.3	10.2	5.4	14.8	14.4	14
COBALT	0.58 J	10 U	0.56 J	10 U	10 U	0.57 J	10 U	10 U	10 U	10 U	10 U	10 U
COPPER	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	7.1	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
IRON	2900	6700	4510 J	3440	2780	2500	3520 J	3620 J	4610 J	11900 J	11150 J	10400 J
LEAD	3.3	4.9	4.4	4.7	3	13.8	3.6	3.2	3.6	4.7	4.4	4.1
MAGNESIUM	121 J	124 J	156 J	85.7 J	94.4 J	99 J	74.8 J	84.2 J	63.6 J	51.2 J	46.5 J	41.8 J
MANGANESE	112	53.2	35.3	10.9	52.4	55.3	51.9	56.3	23.1	10.8	8.8	6.8
MERCURY	0.02 J	0.01 J	0.1 U	0.01 J	0.02 J	0.19	0.01 J		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	8 UJ	8 UJ	8 UJ	8 U	8 UJ	8 U	8 UJ	8 U	8 UJ	8 U	8 UJ	8 UJ
POTASSIUM	1000 U	1000 U	137 J	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
SELENIUM	1 UJ	0.27 J	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 UJ	0.25 J	0.25 J
SILVER	2 U	2 U	2 U	2 U	2 U	2 J	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
THALLIUM	2 U	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 U
VANADIUM	7.2 J	17.5	11.5	8.6 J	6.8 J	5.6 J	8.5 J	8.6 J	11.4	35.9	33.85	31.8
ZINC	3.9 J	5.5	5.4	3.3 J	3.2 J	15.9	3.1 J	11.2	2.7 J	4 UJ	4 UJ	4 UJ
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.31 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S018	15-S019	15-S020	15-S020	15-S020	15-S021	15-S022	15-S023	15-S024	15-S025
NSAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001-D	15S02101	15S02201	15S02301	15S02401	15S02501
SAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001D	15S02101	15S02201	15S02301	15S02401	15S02501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
2-HEXANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
ACETONE	11 U	11 U	11 U	11 U	11 U	11 J	11 U	11 U	11 U	11 U
BENZENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOFORM	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLORODIBROMOMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
ETHYLBENZENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	11 U	11 U	11 U	5 J	5 J	9	11 U	11 U	11 U	11 U
STYRENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOLUENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL XYLENES	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
VINYL ACETATE										
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
1,2-DICHLOROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
1,3-DICHLOROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
1,4-DICHLOROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S018	15-S019	15-S020	15-S020	15-S020	15-S021	15-S022	15-S023	15-S024	15-S025
NSAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001-D	15S02101	15S02201	15S02301	15S02401	15S02501
SAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001D	15S02101	15S02201	15S02301	15S02401	15S02501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
2,4,6-TRICHLOROPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2,4-DICHLOROPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2,4-DIMETHYLPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2,4-DINITROPHENOL	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
2,4-DINITROTOLUENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2,6-DINITROTOLUENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2-CHLORONAPHTHALENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2-CHLOROPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2-METHYLNAPHTHALENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2-METHYLPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
2-NITROANILINE	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
2-NITROPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
3,3'-DICHLOROBENZIDINE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
3-NITROANILINE	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
4,6-DINITRO-2-METHYLPHENOL	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
4-BROMOPHENYL PHENYL ETHER	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
4-CHLORO-3-METHYLPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
4-CHLOROANILINE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
4-METHYLPHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
4-NITROANILINE	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
4-NITROPHENOL	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
ACENAPHTHENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
ACENAPHTHYLENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
ANTHRACENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZO(A)ANTHRACENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZO(A)PYRENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZO(B)FLUORANTHENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZO(G,H,I)PERYLENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZO(K)FLUORANTHENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BENZOIC ACID										
BENZYL ALCOHOL										
BIS(2-CHLOROETHOXY)METHANE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BIS(2-CHLOROETHYL)ETHER	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BUTYL BENZYL PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
CHRYSENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DI-N-BUTYL PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DI-N-OCTYL PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DIBENZO(A,H)ANTHRACENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S018	15-S019	15-S020	15-S020	15-S020	15-S021	15-S022	15-S023	15-S024	15-S025
NSAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001-D	15S02101	15S02201	15S02301	15S02401	15S02501
SAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001D	15S02101	15S02201	15S02301	15S02401	15S02501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DIETHYL PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DIMETHYL PHTHALATE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
FLUORANTHENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
FLUORENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
HEXACHLOROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
HEXACHLOROBUTADIENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
HEXACHLOROCYCLOPENTADIENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
HEXACHLOROETHANE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
INDENO(1,2,3-CD)PYRENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
ISOPHORONE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
N-NITROSODIPHENYLAMINE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
NAPHTHALENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
NITROBENZENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
PENTACHLOROPHENOL	900 U	920 U	900 U	900 U	900 U	920 U	900 U	990 U	920 U	950 U
PHENANTHRENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
PHENOL	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
PYRENE	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
Pesticides PCBs (ug/kg)										
4,4'-DDD	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
4,4'-DDE	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	1.9 J	3.6 U	3.6 U	3.7 U	4 UJ
4,4'-DDT	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
ALDRIN	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
ALPHA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	2 UJ
ALPHA-CHLORDANE	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
AROCLOR-1016	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
AROCLOR-1221	73 U	73 U	72 U	72 U	72 U	73 U	73 U	73 U	74 U	81 UJ
AROCLOR-1232	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
AROCLOR-1242	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
AROCLOR-1248	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
AROCLOR-1254	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
AROCLOR-1260	36 U	36 U	35 U	35 U	35 U	36 U	36 U	36 U	37 U	40 UJ
BETA-BHC	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
DELTA-BHC	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
DIELDRIN	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
ENDOSULFAN I	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
ENDOSULFAN II	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
ENDOSULFAN SULFATE	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
ENDRIN	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ

APPENDIX TABLE A-7-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S018	15-S019	15-S020	15-S020	15-S020	15-S021	15-S022	15-S023	15-S024	15-S025
NSAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001-D	15S02101	15S02201	15S02301	15S02401	15S02501
SAMPLE	15S01801	15S01901	15S02001	15S02001-AVG	15S02001D	15S02101	15S02201	15S02301	15S02401	15S02501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
GAMMA-CHLORDANE	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
HEPTACHLOR	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U	2 UJ
METHOXYCHLOR	18 U	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	20 UJ
TOXAPHENE	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	190 U	200 UJ
Inorganics (mg/kg)										
ALUMINUM	6020	6040	4630	5050	5470	4050	3910	3280	5410	5420
ANTIMONY	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 UJ	12 UJ
ARSENIC	1 J	1.2 J	1.2 J	1.15 J	1.1 J	1.1 J	0.85 J	0.77 J	1.1 J	1.1 J
BARIUM	7.7 J	8.4 J	5.6 J	6.1 J	6.6 J	4.4 J	5.2 J	4.5 J	7.3 J	6.9 J
BERYLLIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CADMIUM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	1000 UJ	40.3 J	1000 UJ	25.2 J	25.2 J	1000 UJ	27.3 J	27.9 J	36.9 J	36.9 J
CHROMIUM	3.8	5.2	3	3.35	3.7	2.8	2.8	4.4	3.9	3.3
COBALT	0.53 J	0.88 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COPPER	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	4.4 J	5 UJ
IRON	3040 J	3220 J	2500 J	2725 J	2950 J	2090 J	1940 J	1610 J	2620 J	2800 J
LEAD	3.9	4.2	5.9	5.9	5.9	2.8	2.7	2.3	3.7	6.1
MAGNESIUM	108 J	99.1 J	85 J	96 J	107 J	74.3 J	81.1 J	65.7 J	106 J	85.7 J
MANGANESE	116	139	75.2	81.15	87.1	43.3	52.1	52.8	86.3	122
MERCURY	0.01 J	0.04 J	0.02 J	0.02 J	0.02 J	0.01 J	0.01 J	0.01 J	0.02 J	0.02 J
NICKEL	8 UJ	8 UJ	8 UJ	8 UJ	8 U	8 UJ	3.3 J	8 U	8 UJ	8 U
POTASSIUM	201 J	1000 U	1000 U	1000 U	1000 U	146 J	1000 U	1000 U	1000 U	1000 U
SELENIUM	0.24 J	0.3 J	0.26 J	0.26 J	1 U	1 UJ	1 UJ	1 U	1 UJ	1 UJ
SILVER	2 U	2 U	2 U	2 U	2 U	0.67 J	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 U	1000 UJ	1000 UJ	1000 UJ
THALLIUM	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
VANADIUM	7.4 J	7.7 J	5.7 J	6.4 J	7.1 J	4.8 J	4.7 J	4.1 J	6.7 J	6.6 J
ZINC	3.5 J	3.7 J	3 J	3.55 J	4.1 J	2.7 J	4 UJ	2.4 J	4 J	3.6 J
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015
LOCATION	TP-15-02	TP-15-05	TP-15-06	TP-15-08	TP-15-10
NSAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	10 - 12	10 - 12	10 - 12	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/2/1992	10/3/1992	10/3/1992	10/4/1992	10/4/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	11 U
2-HEXANONE	3 J	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	11 U
ACETONE	87 UJ	47 UJ	11 U	63 UJ	12 UJ
BENZENE	11 U	11 U	11 U	11 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	11 U
BROMOFORM	11 U	11 U	11 U	11 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 U	11 U	11 U	2 J	11 U
CHLORODIBROMOMETHANE	11 U	11 U	11 U	11 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	11 U	11 U	11 U	11 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U
ETHYLBENZENE	11 U	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ
STYRENE	11 U	11 U	11 U	11 U	11 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	11 U
TOLUENE	11 U	11 U	11 U	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U
TOTAL XYLENES	4 J	11 U	5 J	5 J	6 J
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	11 U
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE	360 U	350 U	360 U	370 U	350 U
1,2-DICHLOROBENZENE	360 U	350 U	360 U	370 U	350 U
1,3-DICHLOROBENZENE	360 U	350 U	360 U	370 U	350 U
1,4-DICHLOROBENZENE	360 U	350 U	360 U	110 J	350 U
2,4,5-TRICHLOROPHENOL	870 U	850 U	870 U	900 U	850 U

APPENDIX TABLE A-7-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015
LOCATION	TP-15-02	TP-15-05	TP-15-06	TP-15-08	TP-15-10
NSAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	10 - 12	10 - 12	10 - 12	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/2/1992	10/3/1992	10/3/1992	10/4/1992	10/4/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	360 U	350 U	360 U	370 U	350 U
2,4-DICHLOROPHENOL	360 U	350 U	360 U	370 U	350 U
2,4-DIMETHYLPHENOL	360 U	350 U	360 U	370 U	350 U
2,4-DINITROPHENOL	870 U	850 U	870 U	900 U	850 U
2,4-DINITROTOLUENE	360 U	350 UJ	360 U	370 U	350 U
2,6-DINITROTOLUENE	360 U	350 UJ	360 U	370 U	350 U
2-CHLORONAPHTHALENE	360 U	350 U	360 U	370 U	350 U
2-CHLOROPHENOL	360 U	350 U	360 U	370 U	350 U
2-METHYLNAPHTHALENE	360 U	350 U	68 J	76 J	350 U
2-METHYLPHENOL	360 U	350 U	360 U	370 U	350 U
2-NITROANILINE	870 U	850 U	870 U	900 U	850 U
2-NITROPHENOL	360 U	350 U	360 U	370 U	350 U
3,3'-DICHLOROBENZIDINE	360 U	350 U	360 U	370 UJ	350 UJ
3-NITROANILINE	870 U	850 UJ	870 U	900 U	850 U
4,6-DINITRO-2-METHYLPHENOL	870 U	850 U	870 U	900 U	850 U
4-BROMOPHENYL PHENYL ETHER	360 U	350 U	360 U	370 U	350 U
4-CHLORO-3-METHYLPHENOL	360 U	350 U	360 U	370 U	350 U
4-CHLOROANILINE	360 U	350 U	360 U	370 U	350 U
4-METHYLPHENOL	42 J	350 U	77 J	370 U	350 U
4-NITROANILINE	870 U	850 UJ	870 U	900 U	850 U
4-NITROPHENOL	870 U	850 U	870 U	900 UJ	850 UJ
ACENAPHTHENE	360 U	350 U	360 U	370 U	350 U
ACENAPHTHYLENE	360 U	350 U	360 U	370 U	350 U
ANTHRACENE	360 U	350 U	360 U	370 U	350 U
BENZO(A)ANTHRACENE	360 U	350 U	360 U	370 U	350 U
BENZO(A)PYRENE	360 U	350 U	360 U	370 U	350 U
BENZO(B)FLUORANTHENE	360 U	350 U	360 U	370 U	350 U
BENZO(G,H,I)PERYLENE	360 U	350 U	360 U	370 U	350 U
BENZO(K)FLUORANTHENE	360 U	350 U	360 U	370 U	350 U
BIS(2-CHLOROETHOXY)METHANE	360 U	350 U	360 U	370 U	350 U
BIS(2-CHLOROETHYL)ETHER	360 U	350 U	360 U	370 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	42 J	350 UJ	230 J	370 UJ	350 UJ
BUTYL BENZYL PHTHALATE	360 UJ	350 U	360 UJ	370 UJ	350 UJ
CHRYSENE	360 U	350 U	360 U	370 U	350 U
DI-N-BUTYL PHTHALATE	360 UJ	350 UJ	360 U	370 U	350 UJ
DI-N-OCTYL PHTHALATE	360 U	350 U	360 U	370 U	350 U
DIBENZO(A,H)ANTHRACENE	360 U	350 U	360 U	370 U	350 U
DIBENZOFURAN	360 U	350 U	360 U	370 U	350 U
DIETHYL PHTHALATE	41 J	350 U	360 U	370 U	350 U
DIMETHYL PHTHALATE	360 U	350 U	360 U	370 U	350 U

APPENDIX TABLE A-7-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015
LOCATION	TP-15-02	TP-15-05	TP-15-06	TP-15-08	TP-15-10
NSAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	10 - 12	10 - 12	10 - 12	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/2/1992	10/3/1992	10/3/1992	10/4/1992	10/4/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	360 U	350 U	360 U	370 U	350 U
FLUORENE	360 U	350 U	360 U	370 U	350 U
HEXACHLOROBENZENE	360 U	350 U	360 U	370 U	350 U
HEXACHLOROBUTADIENE	360 U	350 U	360 U	370 U	350 U
HEXACHLOROCYCLOPENTADIENE	360 U	350 U	360 U	370 U	350 U
HEXACHLOROETHANE	360 U	350 U	360 U	370 U	350 U
INDENO(1,2,3-CD)PYRENE	360 U	350 U	360 U	370 U	350 U
ISOPHORONE	360 UJ	350 UJ	360 UJ	370 UJ	350 UJ
N-NITROSO-DI-N-PROPYLAMINE	360 UJ	350 U	360 UJ	370 U	350 U
N-NITROSODIPHENYLAMINE	360 U	350 U	360 U	370 U	350 U
NAPHTHALENE	360 U	350 U	140 J	92 J	350 U
NITROBENZENE	360 UJ	350 UJ	360 UJ	370 U	350 U
PENTACHLOROPHENOL	870 U	850 U	870 U	900 U	850 U
PHENANTHRENE	360 U	350 U	360 U	370 U	350 U
PHENOL	53 J	350 U	360 U	370 U	350 U
PYRENE	360 U	350 U	360 U	370 U	350 U
Pesticides PCBs (ug/kg)					
4,4'-DDD	3.5 U	3.5 U	3.6 U	37 U	3.5 U
4,4'-DDE	3.5 U	3.5 U	3.6 U	37 U	2.3 J
4,4'-DDT	3.5 U	3.5 U	3.6 U	37 U	3.5 U
ALDRIN	1.8 U	1.8 U	1.8 U	19 U	1.8 U
ALPHA-BHC	1.8 U	1.8 U	1.8 U	19 U	1.8 U
ALPHA-CHLORDANE	1.8 U	1.8 U	1.8 U	19 U	1.8 U
AROCLOR-1016	35 U	35 U	36 U	370 U	35 U
AROCLOR-1221	72 U	71 U	73 U	750 U	71 U
AROCLOR-1232	35 U	35 U	36 U	370 U	35 U
AROCLOR-1242	35 U	35 U	36 U	2200	35 U
AROCLOR-1248	35 U	35 U	36 U	370 U	35 U
AROCLOR-1254	35 U	35 U	36 U	370 U	35 U
AROCLOR-1260	35 U	35 U	36 U	370 U	35 U
BETA-BHC	1.8 U	1.8 U	1.8 U	19 U	1.8 U
DELTA-BHC	1.8 U	1.8 U	1.8 U	19 U	1.8 U
DIELDRIN	3.5 U	3.5 U	3.6 U	37 U	3.5 U
ENDOSULFAN I	1.8 U	1.8 U	1.8 U	19 U	1.8 U
ENDOSULFAN II	3.5 U	3.5 U	3.6 U	37 U	3.5 U
ENDOSULFAN SULFATE	3.5 U	3.5 U	3.6 U	37 U	3.5 U
ENDRIN	3.5 U	3.5 U	3.6 U	37 U	3.5 U
ENDRIN KETONE	3.5 U	3.5 U	3.6 U	37 U	3.5 U
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.8 U	19 U	1.8 U
GAMMA-CHLORDANE	1.8 U	1.8 U	1.8 U	19 U	1.8 U

APPENDIX TABLE A-7-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015
LOCATION	TP-15-02	TP-15-05	TP-15-06	TP-15-08	TP-15-10
NSAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	10 - 12	10 - 12	10 - 12	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/2/1992	10/3/1992	10/3/1992	10/4/1992	10/4/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.8 U	1.8 U	1.8 U	19 U	1.8 U
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	1.8 U	19 U	1.8 U
METHOXYCHLOR	18 U	18 U	18 U	190 U	18 U
TOXAPHENE	180 U	180 U	180 U	1900 U	180 U
Inorganics (mg/kg)					
ALUMINUM	13900	3520	7250	15100	7760
ANTIMONY	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U
ARSENIC	2.6	0.63 J	1.5 J	2.6	1.9 J
BARIUM	5 J	1.6 J	9.6 J	13.2 J	6.5 J
BERYLLIUM	0.17 J	0.05 U	0.11 J	0.16 J	0.09 J
CADMIUM	0.65 U	0.64 U	2.1	0.66 U	0.63 U
CALCIUM	131 J	72.7 J	148 J	267 J	264 J
CHROMIUM	11	3.8	6.6	12.7	6.5
COBALT	0.71 J	0.71 U	0.72 U	0.73 U	0.71 U
COPPER	5.9	0.86 J	3.5 J	6.8	3.6 J
IRON	7520	2100	3650	9640	4530
LEAD	4.3	2.8	5.7	8.4	86.2
MAGNESIUM	78.9 J	18.8 J	109 J	96 J	70.7 J
MANGANESE	21.4	10	22.9	44.2	28.1
MERCURY	0.44 J	0.09 J	0.44 J	0.59	0.43 J
NICKEL	2.3 J	1.1 U	2.1 J	1.2 U	3 J
POTASSIUM	137 J	145 U	157 J	154 J	145 U
SELENIUM	0.45 U	0.45 U	0.46 U	0.46 U	0.45 U
SILVER	0.51 J	0.43 U	0.48 J	0.62 J	0.43 U
SODIUM	175 J	165 J	175 J	191 J	182 J
THALLIUM	0.34 U	0.34 U	0.35 U	0.35 U	0.34 U
VANADIUM	22.5	6.5 J	11.1	25	13.9
ZINC	9.9 J	3.1 J	12.9	19.1	7.4 J
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.09 U		0.55 J	0.09 U	0.09 U

APPENDIX TABLE A-7-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0015**
LOCATION	**15-S015**
NSAMPLE	**15S01501**
SAMPLE	**15S01501**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**12/9/1995**
COLLECTION METHOD	**GRAB**
Volatile Organics (ug/kg)	
1,1,1-TRICHLOROETHANE	11 U
1,1,2,2-TETRACHLOROETHANE	11 U
1,1,2-TRICHLOROETHANE	11 U
1,1-DICHLOROETHANE	11 U
1,1-DICHLOROETHENE	11 U
1,2-DICHLOROETHANE	11 U
1,2-DICHLOROPROPANE	11 U
2-BUTANONE	11 U
2-HEXANONE	11 U
4-METHYL-2-PENTANONE	11 U
ACETONE	13 U
BENZENE	11 U
BROMODICHLOROMETHANE	11 U
BROMOFORM	11 U
BROMOMETHANE	11 U
CARBON DISULFIDE	11 U
CARBON TETRACHLORIDE	11 U
CHLOROBENZENE	11 U
CHLORODIBROMOMETHANE	11 U
CHLOROETHANE	11 U
CHLOROFORM	11 U
CHLOROMETHANE	11 U
CIS-1,3-DICHLOROPROPENE	11 U
ETHYLBENZENE	11 U
METHYLENE CHLORIDE	11 U
STYRENE	11 U
TETRACHLOROETHENE	11 U
TOLUENE	11 U
TOTAL 1,2-DICHLOROETHENE	11 U
TOTAL XYLENES	11 U
TRANS-1,3-DICHLOROPROPENE	11 U
TRICHLOROETHENE	11 U
VINYL CHLORIDE	11 U
Semivolatile Organics (ug/kg)	
1,2,4-TRICHLOROBENZENE	380 U
1,2-DICHLOROBENZENE	380 U
1,3-DICHLOROBENZENE	380 U
1,4-DICHLOROBENZENE	380 U
2,4,5-TRICHLOROPHENOL	950 U

APPENDIX TABLE A-7-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015
LOCATION	15-S015
NSAMPLE	15S01501
SAMPLE	15S01501
SUBMATRIX	SS
SACODE	NORMAL
DEPTH RANGE	0 - 1
STATUS	EXCAVATED
SAMPLE DATE	12/9/1995
COLLECTION METHOD	GRAB
2,4,6-TRICHLOROPHENOL	380 U
2,4-DICHLOROPHENOL	380 U
2,4-DIMETHYLPHENOL	380 U
2,4-DINITROPHENOL	950 U
2,4-DINITROTOLUENE	380 U
2,6-DINITROTOLUENE	380 U
2-CHLORONAPHTHALENE	380 U
2-CHLOROPHENOL	380 U
2-METHYLNAPHTHALENE	380 U
2-METHYLPHENOL	380 U
2-NITROANILINE	950 U
2-NITROPHENOL	380 U
3,3'-DICHLOROBENZIDINE	380 U
3-NITROANILINE	950 U
4,6-DINITRO-2-METHYLPHENOL	950 U
4-BROMOPHENYL PHENYL ETHER	380 U
4-CHLORO-3-METHYLPHENOL	380 U
4-CHLOROANILINE	380 U
4-METHYLPHENOL	380 U
4-NITROANILINE	950 U
4-NITROPHENOL	950 U
ACENAPHTHENE	380 U
ACENAPHTHYLENE	380 U
ANTHRACENE	380 U
BENZO(A)ANTHRACENE	380 U
BENZO(A)PYRENE	380 U
BENZO(B)FLUORANTHENE	380 U
BENZO(G,H,I)PERYLENE	380 U
BENZO(K)FLUORANTHENE	380 U
BIS(2-CHLOROETHOXY)METHANE	380 U
BIS(2-CHLOROETHYL)ETHER	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U
BUTYL BENZYL PHTHALATE	380 U
CHRYSENE	380 U
DI-N-BUTYL PHTHALATE	380 U
DI-N-OCTYL PHTHALATE	380 U
DIBENZO(A,H)ANTHRACENE	380 U
DIBENZOFURAN	380 U
DIETHYL PHTHALATE	380 U
DIMETHYL PHTHALATE	380 U

APPENDIX TABLE A-7-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0015**
LOCATION	**15-S015**
NSAMPLE	**15S01501**
SAMPLE	**15S01501**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**12/9/1995**
COLLECTION METHOD	**GRAB**
FLUORANTHENE	380 U
FLUORENE	380 U
HEXACHLOROBENZENE	380 U
HEXACHLOROBUTADIENE	380 U
HEXACHLOROCYCLOPENTADIENE	380 U
HEXACHLOROETHANE	380 U
INDENO(1,2,3-CD)PYRENE	380 U
ISOPHORONE	380 U
N-NITROSO-DI-N-PROPYLAMINE	380 U
N-NITROSODIPHENYLAMINE	380 U
NAPHTHALENE	380 U
NITROBENZENE	380 U
PENTACHLOROPHENOL	950 U
PHENANTHRENE	380 U
PHENOL	380 U
PYRENE	380 U
Pesticides PCBs (ug/kg)	
4,4'-DDD	3.7 U
4,4'-DDE	3.7 U
4,4'-DDT	3.7 U
ALDRIN	1.9 U
ALPHA-BHC	1.9 UJ
ALPHA-CHLORDANE	1.9 U
AROCLOR-1016	37 U
AROCLOR-1221	76 U
AROCLOR-1232	37 U
AROCLOR-1242	37 U
AROCLOR-1248	37 U
AROCLOR-1254	37 U
AROCLOR-1260	37 U
BETA-BHC	1.9 U
DELTA-BHC	1.9 U
DIELDRIN	3.7 U
ENDOSULFAN I	1.9 U
ENDOSULFAN II	3.7 U
ENDOSULFAN SULFATE	3.7 U
ENDRIN	3.7 U
ENDRIN KETONE	3.7 U
GAMMA-BHC (LINDANE)	1.9 U
GAMMA-CHLORDANE	1.9 U

APPENDIX TABLE A-7-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0015**
LOCATION	**15-S015**
NSAMPLE	**15S01501**
SAMPLE	**15S01501**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**12/9/1995**
COLLECTION METHOD	**GRAB**
HEPTACHLOR	1.9 U
HEPTACHLOR EPOXIDE	1.9 U
METHOXYCHLOR	19 U
TOXAPHENE	190 U
Inorganics (mg/kg)	
ALUMINUM	13400
ANTIMONY	12 UJ
ARSENIC	6.8
BARIUM	11.8 J
BERYLLIUM	1 UJ
CADMIUM	1 U
CALCIUM	189 J
CHROMIUM	12.4
COBALT	10 U
COPPER	4.2 J
IRON	9790 J
LEAD	9.7
MAGNESIUM	114 J
MANGANESE	44.3
MERCURY	0.02 J
NICKEL	8 U
POTASSIUM	1000 U
SELENIUM	0.41 J
SILVER	2 U
SODIUM	1000 UJ
THALLIUM	2 UJ
VANADIUM	26.2
ZINC	5.3
Miscellaneous Parameters (mg/kg)	
CYANIDE	0.09 J

APPENDIX TABLE A-7-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15-S001	15-S001	15-S001	15-S002	15-S003	15-S004	15-S005	15-S006
NSAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101-D	15S00201	15S00301	15S00401	15S00501	15S00601
SAMPLE	15-SL-01	15-SL-02	15-SL-03	15-SL-04	15-SL-05	15S00101	15S00101-AVG	15S00101D	15S00201	15S00301	15S00401	15S00501	15S00601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	8/11/1992	8/11/1992	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995	12/11/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)													
ACETONE	11 UJ	11 U	11 U	11 U	13 U	11 U	11 U	11 U	13 U	11 U	11 U	10 U	11 U
METHYLENE CHLORIDE	5 UJ	5 UJ	7 UJ	6 UJ	7 UJ	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
TOTAL XYLENES	5 U	1 J	2 J	4 J	7 U	11 U	11 U	11 U	11 U	11 U	11 U	10 U	11 U
Semivolatile Organics (ug/kg)													
BIS(2-ETHYLHEXYL)PHTHALATE	39 J	350 U	41 J	350 U	350 U	390 U	947.5	1700	370 U	360 U	430 U	370 U	360 U
BUTYL BENZYL PHTHALATE	360 UJ	350 UJ	370 UJ	350 UJ	350 UJ	390 U	375 U	360 U	240 J	360 U	430 U	370 U	360 U
DI-N-BUTYL PHTHALATE	360 UJ	350 UJ	370 UJ	350 UJ	350 U	390 U	375 U	360 U	1100	790	730	770	850
Pesticides PCBs (ug/kg)													
4,4'-DDD	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
4,4'-DDE	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
4,4'-DDT	17 U	17 U	18 U	17 U	17 U	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.6 U	3.6 U	3.6 U
Inorganics (mg/kg)													
ALUMINUM	11800	5160	7450	6790	4940	9280	10040	10800	6210	10200	12400	5290	11900
ARSENIC	1.6 J	0.93 J	2.2 J	1 J	0.98 J	2 J	1.95 J	1.9 J	1.3 J	2 J	2.7	1.2 J	2.1 J
BARIUM	5.3 J	7 J	4.3 J	9 J	3.2 J	6.6 J	7.2 J	7.8 J	4.7 J	6.9 J	7.4 J	5.5 J	7.3 J
BERYLLIUM	0.07 J	0.05 U	0.08 J	0.09 J	0.05 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CALCIUM	75.6 J	137 J	79.6 J	78.9 J	136 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
CHROMIUM	10.8	3.3	6.3	3.9	3.8	8.4	8.2	8	8.1	6.9	9.1	4.6	8.5
COBALT	1.2 J	0.73 J	0.85 J	1 J	0.33 U	10 U	10 U	10 U	10 U	10 U	10 U	0.55 J	0.49 J
COPPER	4.1 J	4.2 J	1.6 J	5.1 J	12.5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
IRON	7760	3040	4980	3460	2810	5120	5410	5700	3760	5100	6570	3490	6400
LEAD	2.8 J	4.4 J	4.4 J	10.7 J	59.9	4.7	4.15	3.6	2.8	6	3.6	3.2	5.5
MAGNESIUM	54.3 J	74.3 J	43 J	93.9 J	57.8 J	109 J	120.5 J	132 J	72.2 J	133 J	121 J	84.9 J	135 J
MANGANESE	23.1	25.7	9.3	143	13.7	36.4	38.15	39.9	35.7	12.9	34.4	43.3	30.8
MERCURY	0.06 U	0.07 U	0.08 U	0.08 U	0.07 U	0.02 J	0.02 J	0.02 J	0.01 J	0.01 J	0.01 J	0.01 J	0.01 J
NICKEL	2.3 U	2.3 U	2.4 U	2.3 U	2.3 U	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ
POTASSIUM	130 U	129 U	133 U	130 U	128 U	169 J	169 J	1000 U	1000 U	131	1000 U	1000 U	1000 U
SELENIUM	0.4 U	0.4 U	0.41 U	0.4 U	0.39 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
SILVER	0.32 U	0.32 U	0.33 U	0.32 U	0.32 U	2 U	2 U	2 U	0.74 J	2 U	2 U	0.66 J	2 U
SODIUM	170 J	174 J	172 J	174 J	179 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
VANADIUM	20.6	6.8 J	12.6	8.3 J	7.2 J	13.3	14.2	15.1	9.6 J	14.5	17.8	7.5 J	17
ZINC	11.3	6.8 J	5.4 J	7.4 J	8.8	4.1 J	4.55 J	5	2.8 J	6.3	4.9	3.7 J	7.1
Miscellaneous Parameters (mg/kg)													
CYANIDE	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.5 U	0.5 U	0.5 U	0.16 J	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S007	15-S008	15-S009	15-S010	15-S011	15-S012	15-S013	15-S014	15-S016	15-S017	15-S017
NSAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG
SAMPLE	15S00701	15S00801	15S00901	15S01001	15S01101	15S01201	15S01301	15S01401	15S01601	15S01701	15S01701-AVG
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/11/1995	12/11/1995	12/11/1995	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/10/1995	12/10/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
ACETONE	11 U	11 U	11 U	22 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	11 U	11 U	11 U	12 U	3 J	4 J	11 U	11 U	11 U	11 U	11 U
TOTAL XYLENES	11 U	11 U	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	170 J	360 U	380 U	380 U
BUTYL BENZYL PHTHALATE	360 U	360 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U
DI-N-BUTYL PHTHALATE	560	370 U	370 UJ	410 U	360 U	360 U	370 U	360 U	360 U	380 U	380 U
Pesticides PCBs (ug/kg)											
4,4'-DDD	3.5 U	3.6 U	3.9 U	4 U	3.8	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U
4,4'-DDE	3.5 U	3.6 U	3.9 U	3.1 J	50	3.6 U	3.6 U	3.6 U	3.6 U	3.7 U	3.7 U
4,4'-DDT	3.5 U	3.6 U	3.9 U	4 U	14	3.6 U	4.4	3.6 U	3.6 U	3.7 U	3.7 U
Inorganics (mg/kg)											
ALUMINUM	5590	10200	8400	5810	5060	4190	5860	6220	7190	13700	11495
ARSENIC	1 J	1.8 J	1.7 J	1.5 J	0.75 J	0.84 J	1.6 J	1.5 J	1.5 J	3.7	4
BARIUM	8.1 J	9.2 J	9.4 J	6.5 J	7.4 J	11.4 J	5.5 J	7 J	4.9 J	4.4 J	4.1 J
BERYLLIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CALCIUM	1000 UJ	89 J	1000 UJ	1000 UJ	1000 UJ	115 J	29.3 J	23.3 J	25.1 J	23.7 J	22.05 J
CHROMIUM	5.8	8.8	6.1	5.2	3.7	4.7	4.3	10.2	5.4	14.8	14.4
COBALT	0.58 J	10 U	0.56 J	10 U	10 U	0.57 J	10 U	10 U	10 U	10 U	10 U
COPPER	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	7.1	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
IRON	2900	6700	4510 J	3440	2780	2500	3520 J	3620 J	4610 J	11900 J	11150 J
LEAD	3.3	4.9	4.4	4.7	3	13.8	3.6	3.2	3.6	4.7	4.4
MAGNESIUM	121 J	124 J	156 J	85.7 J	94.4 J	99 J	74.8 J	84.2 J	63.6 J	51.2 J	46.5 J
MANGANESE	112	53.2	35.3	10.9	52.4	55.3	51.9	56.3	23.1	10.8	8.8
MERCURY	0.02 J	0.01 J	0.1 U	0.01 J	0.02 J	0.19	0.01 J		0.1 U	0.1 U	0.1 U
NICKEL	8 UJ	8 UJ	8 UJ	8 U	8 UJ	8 U	8 UJ	8 U	8 UJ	8 U	8 UJ
POTASSIUM	1000 U	1000 U	137 J	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
SELENIUM	1 UJ	0.27 J	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 U	1 UJ	0.25 J
SILVER	2 U	2 U	2 U	2 U	2 U	2 J	2 U	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ
VANADIUM	7.2 J	17.5	11.5	8.6 J	6.8 J	5.6 J	8.5 J	8.6 J	11.4	35.9	33.85
ZINC	3.9 J	5.5	5.4	3.3 J	3.2 J	15.9	3.1 J	11.2	2.7 J	4 UJ	4 UJ
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.31 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015	0015
LOCATION	15-S017	15-S018	15-S019	15-S020	15-S020	15-S020	15-S021	15-S022	15-S023	15-S024	15-S025
NSAMPLE	15S01701-D	15S01801	15S01901	15S02001	15S02001-AVG	15S02001-D	15S02101	15S02201	15S02301	15S02401	15S02501
SAMPLE	15S01701D	15S01801	15S01901	15S02001	15S02001-AVG	15S02001D	15S02101	15S02201	15S02301	15S02401	15S02501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	12/10/1995	12/10/1995	12/10/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995	12/9/1995
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
ACETONE	11 U	11 U	11 U	11 U	11 U	11 U	11 J	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	11 U	11 U	11 U	11 U	5 J	5 J	9	11 U	11 U	11 U	11 U
TOTAL XYLENES	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
BUTYL BENZYL PHTHALATE	380 U	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
DI-N-BUTYL PHTHALATE	380 U	360 U	370 U	360 U	360 U	360 U	370 U	360 U	400 U	370 U	380 U
Pesticides PCBs (ug/kg)											
4,4'-DDD	3.7 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
4,4'-DDE	3.7 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	1.9 J	3.6 U	3.6 U	3.7 U	4 UJ
4,4'-DDT	3.7 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U	3.6 U	3.7 U	4 UJ
Inorganics (mg/kg)											
ALUMINUM	9290	6020	6040	4630	5050	5470	4050	3910	3280	5410	5420
ARSENIC	4.3	1 J	1.2 J	1.2 J	1.15 J	1.1 J	1.1 J	0.85 J	0.77 J	1.1 J	1.1 J
BARIUM	3.8 J	7.7 J	8.4 J	5.6 J	6.1 J	6.6 J	4.4 J	5.2 J	4.5 J	7.3 J	6.9 J
BERYLLIUM	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CALCIUM	20.4 J	1000 UJ	40.3 J	1000 UJ	25.2 J	25.2 J	1000 UJ	27.3 J	27.9 J	36.9 J	36.9 J
CHROMIUM	14	3.8	5.2	3	3.35	3.7	2.8	2.8	4.4	3.9	3.3
COBALT	10 U	0.53 J	0.88 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
COPPER	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	4.4 J	5 UJ
IRON	10400 J	3040 J	3220 J	2500 J	2725 J	2950 J	2090 J	1940 J	1610 J	2620 J	2800 J
LEAD	4.1	3.9	4.2	5.9	5.9	5.9	2.8	2.7	2.3	3.7	6.1
MAGNESIUM	41.8 J	108 J	99.1 J	85 J	96 J	107 J	74.3 J	81.1 J	65.7 J	106 J	85.7 J
MANGANESE	6.8	116	139	75.2	81.15	87.1	43.3	52.1	52.8	86.3	122
MERCURY	0.1 U	0.01 J	0.04 J	0.02 J	0.02 J	0.02 J	0.01 J	0.01 J	0.01 J	0.02 J	0.02 J
NICKEL	8 UJ	8 UJ	8 UJ	8 UJ	8 UJ	8 U	8 UJ	3.3 J	8 U	8 UJ	8 U
POTASSIUM	1000 U	201 J	1000 U	1000 U	1000 U	1000 U	146 J	1000 U	1000 U	1000 U	1000 U
SELENIUM	0.25 J	0.24 J	0.3 J	0.26 J	0.26 J	1 U	1 UJ	1 UJ	1 U	1 UJ	1 UJ
SILVER	2 U	2 U	2 U	2 U	2 U	2 U	0.67 J	2 U	2 U	2 U	2 U
SODIUM	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 U	1000 UJ	1000 UJ	1000 UJ
VANADIUM	31.8	7.4 J	7.7 J	5.7 J	6.4 J	7.1 J	4.8 J	4.7 J	4.1 J	6.7 J	6.6 J
ZINC	4 UJ	3.5 J	3.7 J	3 J	3.55 J	4.1 J	2.7 J	4 UJ	2.4 J	4 J	3.6 J
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

APPENDIX TABLE A-7-5
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0015	0015	0015	0015	0015
LOCATION	TP-15-02	TP-15-05	TP-15-06	TP-15-08	TP-15-10
NSAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SAMPLE	15SS0201	15SS0502	15SS0603	15SS0804	15SS1005
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	10 - 12	10 - 12	10 - 12	5 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/2/1992	10/3/1992	10/3/1992	10/4/1992	10/4/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
2-HEXANONE	3 J	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 U	11 U	11 U	2 J	11 U
TOTAL XYLENES	4 J	11 U	5 J	5 J	6 J
Semivolatile Organics (ug/kg)					
1,4-DICHLOROBENZENE	360 U	350 U	360 U	110 J	350 U
2-METHYLNAPHTHALENE	360 U	350 U	68 J	76 J	350 U
4-METHYLPHENOL	42 J	350 U	77 J	370 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	42 J	350 UJ	230 J	370 UJ	350 UJ
DIETHYL PHTHALATE	41 J	350 U	360 U	370 U	350 U
NAPHTHALENE	360 U	350 U	140 J	92 J	350 U
PHENOL	53 J	350 U	360 U	370 U	350 U
Pesticides PCBs (ug/kg)					
4,4'-DDE	3.5 U	3.5 U	3.6 U	37 U	2.3 J
AROCLOR-1242	35 U	35 U	36 U	2200	35 U
Inorganics (mg/kg)					
ALUMINUM	13900	3520	7250	15100	7760
ARSENIC	2.6	0.63 J	1.5 J	2.6	1.9 J
BARIUM	5 J	1.6 J	9.6 J	13.2 J	6.5 J
BERYLLIUM	0.17 J	0.05 U	0.11 J	0.16 J	0.09 J
CADMIUM	0.65 U	0.64 U	2.1	0.66 U	0.63 U
CALCIUM	131 J	72.7 J	148 J	267 J	264 J
CHROMIUM	11	3.8	6.6	12.7	6.5
COBALT	0.71 J	0.71 U	0.72 U	0.73 U	0.71 U
COPPER	5.9	0.86 J	3.5 J	6.8	3.6 J
IRON	7520	2100	3650	9640	4530
LEAD	4.3	2.8	5.7	8.4	86.2
MAGNESIUM	78.9 J	18.8 J	109 J	96 J	70.7 J
MANGANESE	21.4	10	22.9	44.2	28.1
MERCURY	0.44 J	0.09 J	0.44 J	0.59	0.43 J
NICKEL	2.3 J	1.1 U	2.1 J	1.2 U	3 J
POTASSIUM	137 J	145 U	157 J	154 J	145 U
SILVER	0.51 J	0.43 U	0.48 J	0.62 J	0.43 U
SODIUM	175 J	165 J	175 J	191 J	182 J
VANADIUM	22.5	6.5 J	11.1	25	13.9
ZINC	9.9 J	3.1 J	12.9	19.1	7.4 J
Miscellaneous Parameters (mg/kg)					
CYANIDE	0.09 U		0.55 J	0.09 U	0.09 U

APPENDIX TABLE A-7-6
SUMMARY OF CHEMICALS DETECTED - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0015**
LOCATION	**15-S015**
NSAMPLE	**15S01501**
SAMPLE	**15S01501**
SUBMATRIX	**SS**
SACODE	**NORMAL**
DEPTH RANGE	**0 - 1**
STATUS	**EXCAVATED**
SAMPLE DATE	**12/9/1995**
COLLECTION METHOD	**GRAB**
Inorganics (mg/kg)	
ALUMINUM	13400
ARSENIC	6.8
BARIUM	11.8 J
CALCIUM	189 J
CHROMIUM	12.4
COPPER	4.2 J
IRON	9790 J
LEAD	9.7
MAGNESIUM	114 J
MANGANESE	44.3
MERCURY	0.02 J
SELENIUM	0.41 J
VANADIUM	26.2
ZINC	5.3
Miscellaneous Parameters (mg/kg)	
CYANIDE	0.09 J

APPENDIX TABLE A-7-7
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
ACETONE	1/29	11 J	11 J	10 - 22	5.93	11.0	15S02101
METHYLENE CHLORIDE	4/29	3 J	9	5 - 12	5.03	5.25	15S02101
TOTAL XYLENES	3/29	1 J	4 J	5 - 12	5.00	2.33	15-SL-04
Semivolatile Organics (ug/kg)							
BIS(2-ETHYLHEXYL)PHTHALATE	4/29	39 J	1700	350 - 430	201	299	15S00101-D
BUTYL BENZYL PHTHALATE	1/29	240 J	240 J	350 - 430	186	240	15S00201
DI-N-BUTYL PHTHALATE	6/29	560	1100	350 - 410	311	800	15S00201
Pesticides PCBs (ug/kg)							
4,4'-DDD	1/29	3.8	3.8	3.5 - 18	3.06	3.80	15S01101
4,4'-DDE	3/29	1.9 J	50	3.5 - 18	4.70	18.3	15S01101
4,4'-DDT	2/29	4.4	14	3.5 - 18	3.50	9.20	15S01101
Inorganics (mg/kg)							
ALUMINUM	29/29	3280	13700	---	6944	6944	15S01701
ARSENIC	29/29	0.75 J	4.3	---	1.46	1.46	15S01701-D
BARIUM	29/29	3.2 J	11.4 J	---	6.61	6.61	15S01201
BERYLLIUM	3/29	0.07 J	0.09 J	0.05 - 1	0.424	0.0800	15-SL-04
CALCIUM	17/29	20.4 J	137 J	1000	242	59.1	15-SL-02
CHROMIUM	29/29	2.8	14.8	---	5.92	5.92	15S01701
COBALT	11/29	0.49 J	1.2 J	0.33 - 10	3.21	0.722	15-SL-01
COPPER	7/29	1.6 J	12.5	5	3.24	5.57	15-SL-05
IRON	29/29	1610 J	11900 J	---	4088	4088	15S01701
LEAD	29/29	2.3	59.9	---	6.48	6.48	15-SL-05
MAGNESIUM	29/29	41.8 J	156 J	---	91.6	91.6	15S00901
MANGANESE	29/29	6.8	143	---	53.9	53.9	15-SL-04
MERCURY	20/28	0.01 J	0.19	0.06 - 0.1	0.0286	0.0235	15S01201
NICKEL	1/29	3.3 J	3.3 J	2.3 - 8	3.49	3.30	15S02201
POTASSIUM	5/29	131	201 J	128 - 1000	366	157	15S01801
SELENIUM	5/29	0.24 J	0.3 J	0.39 - 1	0.408	0.264	15S01901
SILVER	4/29	0.66 J	2 J	0.32 - 2	0.858	1.02	15S01201
SODIUM	5/29	170 J	179 J	1000	444	174	15-SL-05
VANADIUM	29/29	4.1 J	35.9	---	10.5	10.5	15S01701
ZINC	27/29	2.4 J	15.9	4	5.20	5.43	15S01201
Miscellaneous Parameter (mg/kg)							
CYANIDE	2/29	0.16 J	0.31 J	0.24 - 0.5	0.227	0.235	15S00701

APPENDIX TABLE A-7-8
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-HEXANONE	1/5	3 J	3 J	11	5.00	3.00	15SS0201
CHLOROBENZENE	1/5	2 J	2 J	11	4.80	2.00	15SS0804
TOTAL XYLENES	4/5	4 J	6 J	11	5.10	5.00	15SS1005
Semivolatile Organics (ug/kg)							
1,4-DICHLOROBENZENE	1/5	110 J	110 J	350 - 360	164	110	15SS0804
2-METHYLNAPHTHALENE	2/5	68 J	76 J	350 - 360	135	72.0	15SS0804
4-METHYLPHENOL	2/5	42 J	77 J	350 - 370	131	59.5	15SS0603
BIS(2-ETHYLHEXYL)PHTHALATE	2/5	42 J	230 J	350 - 370	161	136	15SS0603
DIETHYL PHTHALATE	1/5	41 J	41 J	350 - 370	151	41.0	15SS0201
NAPHTHALENE	2/5	92 J	140 J	350 - 360	152	116	15SS0603
PHENOL	1/5	53 J	53 J	350 - 370	154	53.0	15SS0201
Pesticides PCBs (ug/kg)							
4,4'-DDE	1/5	2.3 J	2.3 J	3.5 - 37	5.22	2.30	15SS1005
AROCLOR-1242	1/5	2200	2200	35 - 36	454	2200	15SS0804
Inorganics (mg/kg)							
ALUMINUM	5/5	3520	15100	---	9506	9506	15SS0804
ARSENIC	5/5	0.63 J	2.6	---	1.85	1.85	15SS0201, 15SS0804
BARIUM	5/5	1.6 J	13.2 J	---	7.18	7.18	15SS0804
BERYLLIUM	4/5	0.09 J	0.17 J	0.05	0.111	0.133	15SS0201
CADMIUM	1/5	2.1	2.1	0.63 - 0.66	0.678	2.10	15SS0603
CALCIUM	5/5	72.7 J	267 J	---	177	177	15SS0804
CHROMIUM	5/5	3.8	12.7	---	8.12	8.12	15SS0804
COBALT	1/5	0.71 J	0.71 J	0.71 - 0.73	0.429	0.710	15SS0201
COPPER	5/5	0.86 J	6.8	---	4.13	4.13	15SS0804
IRON	5/5	2100	9640	---	5488	5488	15SS0804
LEAD	5/5	2.8	86.2	---	21.5	21.5	15SS1005
MAGNESIUM	5/5	18.8 J	109 J	---	74.7	74.7	15SS0603
MANGANESE	5/5	10	44.2	---	25.3	25.3	15SS0804
MERCURY	5/5	0.09 J	0.59	---	0.398	0.398	15SS0804
NICKEL	3/5	2.1 J	3 J	1.1 - 1.2	1.71	2.47	15SS1005
POTASSIUM	3/5	137 J	157 J	145	119	149	15SS0603
SILVER	3/5	0.48 J	0.62 J	0.43	0.408	0.537	15SS0804
SODIUM	5/5	165 J	191 J	---	178	178	15SS0804
VANADIUM	5/5	6.5 J	25	---	15.8	15.8	15SS0804
ZINC	5/5	3.1 J	19.1	---	10.5	10.5	15SS0804
Miscellaneous Parameter (mg/kg)							
CYANIDE	1/4	0.55 J	0.55 J	0.09	0.171	0.550	15SS0603

APPENDIX TABLE A-7-9
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

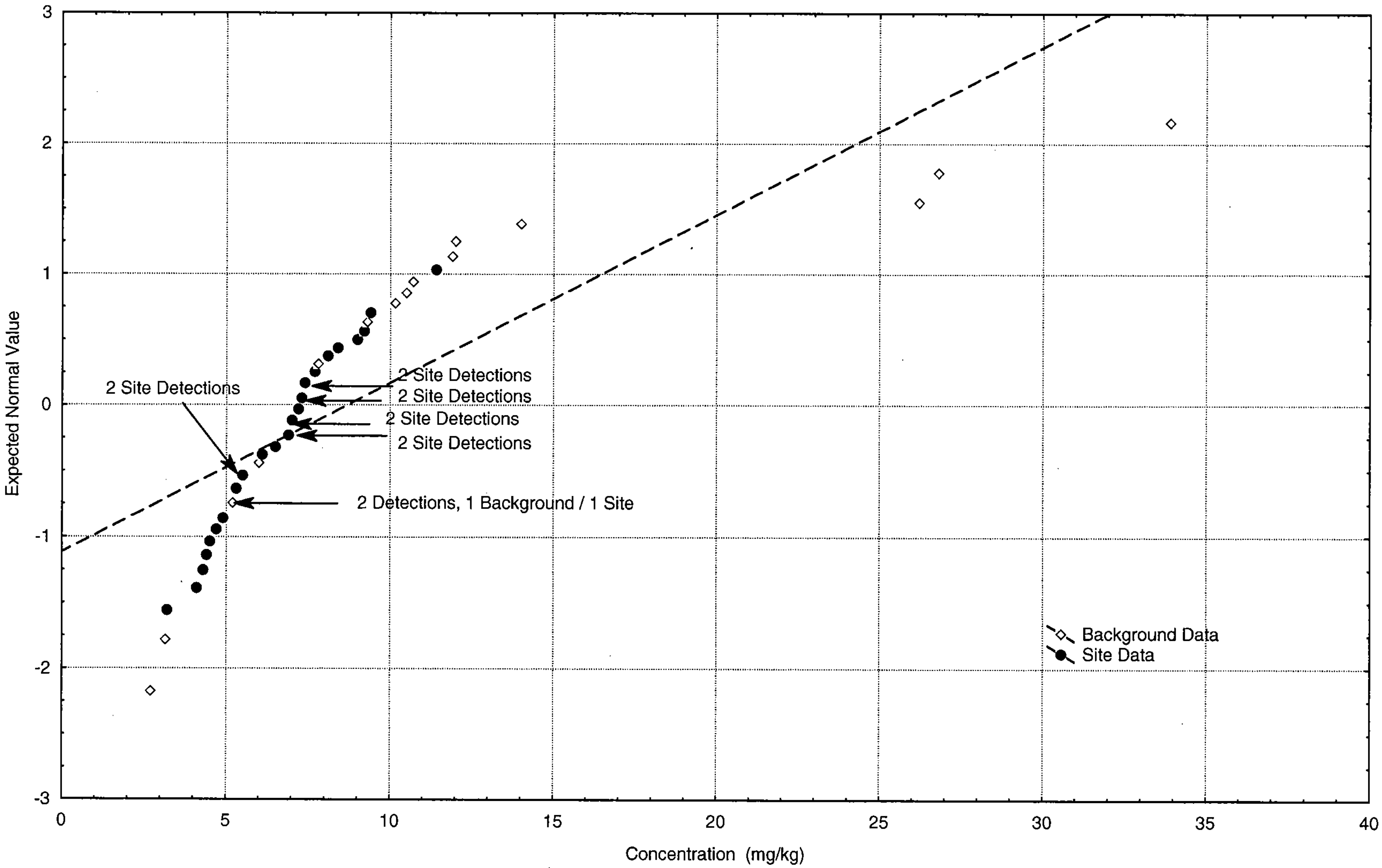
Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)													
ACETONE	**29**	**1**	**3%**	**11.0**	**11.0**	**5.93**	**11.0**	**1.43**	**3.38**	**Shapiro-Wilk**	**Undefined**	**6.36**	**Non-Parametric UCL**
METHYLENE CH	**29**	**4**	**14%**	**3.00**	**9.00**	**5.03**	**5.25**	**1.30**	**0.128**	**Shapiro-Wilk**	**Undefined**	**5.43**	**Non-Parametric UCL**
TOTAL XYLENES	**29**	**3**	**10%**	**1.00**	**4.00**	**5.00**	**2.33**	**1.21**	**-2.322**	**Shapiro-Wilk**	**Undefined**	**4.00**	**Maximum Detected Concentration**
Semivolatile Organics (ug/kg)													
BIS(2-ETHYLHEX	**29**	**4**	**14%**	**39.0**	**948**	**201**	**299**	**149**	**4.77**	**Shapiro-Wilk**	**Undefined**	**245**	**Non-Parametric UCL**
BUTYL BENZYL	**29**	**1**	**3%**	**240**	**240**	**186**	**240**	**13.6**	**2.74**	**Shapiro-Wilk**	**Undefined**	**191**	**Non-Parametric UCL**
DI-N-BUTYL PHT	**29**	**6**	**21%**	**560**	**1100**	**311**	**800**	**265**	**1.85**	**Shapiro-Wilk**	**Undefined**	**388**	**Non-Parametric UCL**
Pesticides PCBs (ug/kg)													
4,4'-DDD	**29**	**1**	**3%**	**3.80**	**3.80**	**3.06**	**3.80**	**2.60**	**1.77**	**Shapiro-Wilk**	**Undefined**	**3.80**	**Maximum Detected Concentration**
4,4'-DDE	**29**	**3**	**10%**	**1.90**	**50.0**	**4.70**	**18.3**	**9.09**	**4.74**	**Shapiro-Wilk**	**Undefined**	**7.43**	**Non-Parametric UCL**
4,4'-DDT	**29**	**2**	**7%**	**4.40**	**14.0**	**3.50**	**9.20**	**3.29**	**1.85**	**Shapiro-Wilk**	**Undefined**	**4.53**	**Non-Parametric UCL**
Inorganics (mg/kg)													
ALUMINUM	29	29	100%	3280	12400	6944	6944	2667	0.861	Shapiro-Wilk	Lognormal	7886	H-UCL
ARSENIC	29	29	100%	0.750	4.00	1.46	1.46	0.687	2.04	Shapiro-Wilk	Lognormal	1.67	H-UCL
BARIUM	29	29	100%	3.20	11.4	6.61	6.61	1.87	0.384	Shapiro-Wilk	Normal/Lognormal	7.21	Student-t
BERYLLIUM	**29**	**3**	**10%**	**0.070**	**0.090**	**0.424**	**0.080**	**0.170**	**-1.850**	**Shapiro-Wilk**	**Undefined**	0.0900	Maximum Detected Concentration
CALCIUM	**29**	**17**	**59%**	**22.1**	**137**	**242**	**59.1**	**223**	**0.312**	**Shapiro-Wilk**	**Undefined**	137	Maximum Detected Concentration
CHROMIUM	29	29	100%	2.80	14.4	5.92	5.92	2.81	1.26	Shapiro-Wilk	Lognormal	6.91	H-UCL
COBALT	**29**	**11**	**38%**	**0.490**	**1.20**	**3.21**	**0.722**	**2.17**	**-0.389**	**Shapiro-Wilk**	**Undefined**	1.20	Maximum Detected Concentration
COPPER	**29**	**7**	**24%**	**1.60**	**12.5**	**3.24**	**5.57**	**2.09**	**3.58**	**Shapiro-Wilk**	**Undefined**	3.90	Non-Parametric UCL
IRON	29	29	100%	1610	11150	4088	4088	2054	1.75	Shapiro-Wilk	Lognormal	4768	H-UCL
LEAD	29	29	100%	2.30	59.9	6.48	6.48	10.5	4.98	Shapiro-Wilk	Undefined	9.60	Non-Parametric UCL
MAGNESIUM	29	29	100%	43.0	156	91.6	91.6	28.0	0.314	Shapiro-Wilk	Normal/Lognormal	100	Student-t
MANGANESE	29	29	100%	8.80	143	53.9	53.9	39.1	1.04	Shapiro-Wilk	Lognormal	78.5	H-UCL
MERCURY	28	20	71%	0.010	0.190	0.029	0.024	0.035	3.98	Shapiro-Wilk	Undefined	0.0395	Non-Parametric UCL
NICKEL	**29**	**1**	**3%**	**3.30**	**3.30**	**3.49**	**3.30**	**1.09**	**-1.781**	**Shapiro-Wilk**	**Undefined**	3.30	Maximum Detected Concentration
POTASSIUM	**29**	**5**	**17%**	**131**	**201**	**366**	**157**	**191**	**-0.765**	**Shapiro-Wilk**	**Undefined**	201	Maximum Detected Concentration
SELENIUM	**29**	**5**	**17%**	**0.240**	**0.300**	**0.408**	**0.264**	**0.131**	**-0.770**	**Shapiro-Wilk**	**Undefined**	0.300	Maximum Detected Concentration
SILVER	**29**	**4**	**14%**	**0.660**	**2.00**	**0.858**	**1.02**	**0.388**	**-0.104**	**Shapiro-Wilk**	**Undefined**	0.976	Non-Parametric UCL
SODIUM	**29**	**5**	**17%**	**170**	**179**	**444**	**174**	**125**	**-1.831**	**Shapiro-Wilk**	**Undefined**	179	Maximum Detected Concentration
VANADIUM	29	29	100%	4.10	33.9	10.5	10.5	6.26	2.14	Shapiro-Wilk	Lognormal	12.4	H-UCL
ZINC	29	27	93%	2.40	15.9	5.20	5.43	3.21	1.81	Shapiro-Wilk	Lognormal	6.26	H-UCL
Miscellaneous Parameters (mg/kg)													
CYANIDE	**29**	**2**	**7%**	**0.160**	**0.310**	**0.227**	**0.235**	**0.054**	**-1.370**	**Shapiro-Wilk**	**Undefined**	**0.243**	**Non-Parametric UCL**

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

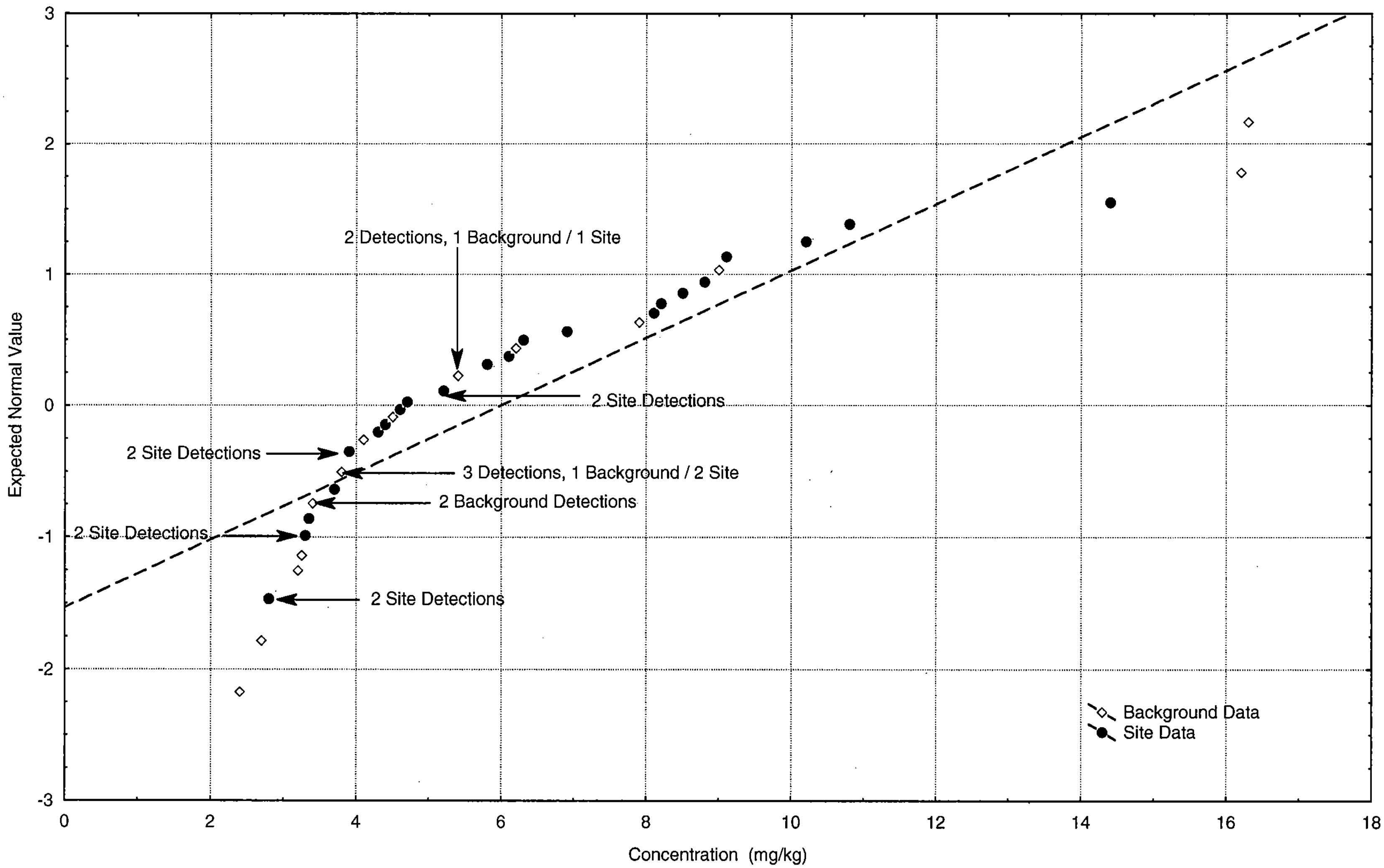
APPENDIX TABLE A-7-10
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 15 SURFACE SOIL																			
BERYLLIUM	3/29	8/15	11/44	75%	**FAIL**	0.09 J	0.35 J	0.424	0.195	---	---	---	---	Proportions	---	---	NO	PASS	NO
COPPER	7/29	12/15	19/44	57%	**FAIL**	12.5	8.5	3.24	3.97	---	---	---	---	Proportions	-3.40	0.000338	NO	PASS	NO
COBALT	**11/29**	12/15	23/44	48%	**FAIL**	1.2 J	2.9 J	3.21	1.48	---	---	---	---	Proportions	---	---	NO	PASS	NO
LEAD	29/29	15/15	44/44	0%	PASS	59.9	9.8 J	6.48	5.49	UNDEFINED	NORMAL	**FAIL**	---	WRS	-1.40	0.161	NO	PASS	NO
MERCURY	20/28	**5/15**	25/44	43%	**FAIL**	0.19	0.07 J	0.0286	0.0355	---	---	---	---	Proportions	-1.233	0.109	NO	PASS	NO
NICKEL	1/29	6/15	7/44	84%	**FAIL**	3.3 J	5.9 J	3.49	2.65	---	---	---	---	Proportions	-2.013	0.0221	NO	PASS	NO
ZINC	27/29	13/15	40/44	9%	PASS	15.9	16.3 J	5.20	7.66	LOGNORMAL	NORMAL	**FAIL**	---	WRS	-2.18	0.0293	NO	PASS	NO

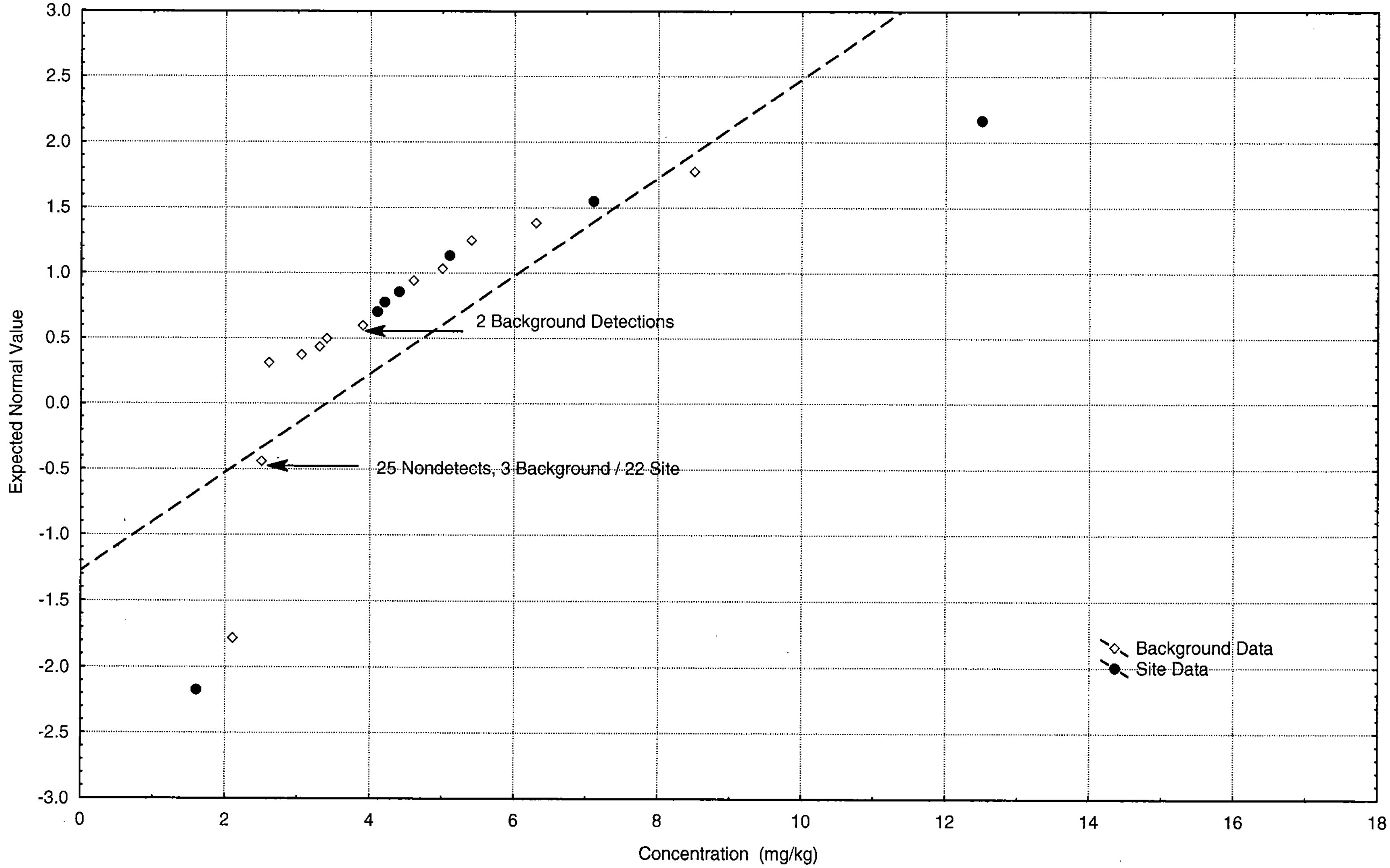
APPENDIX FIGURE A-7-1
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



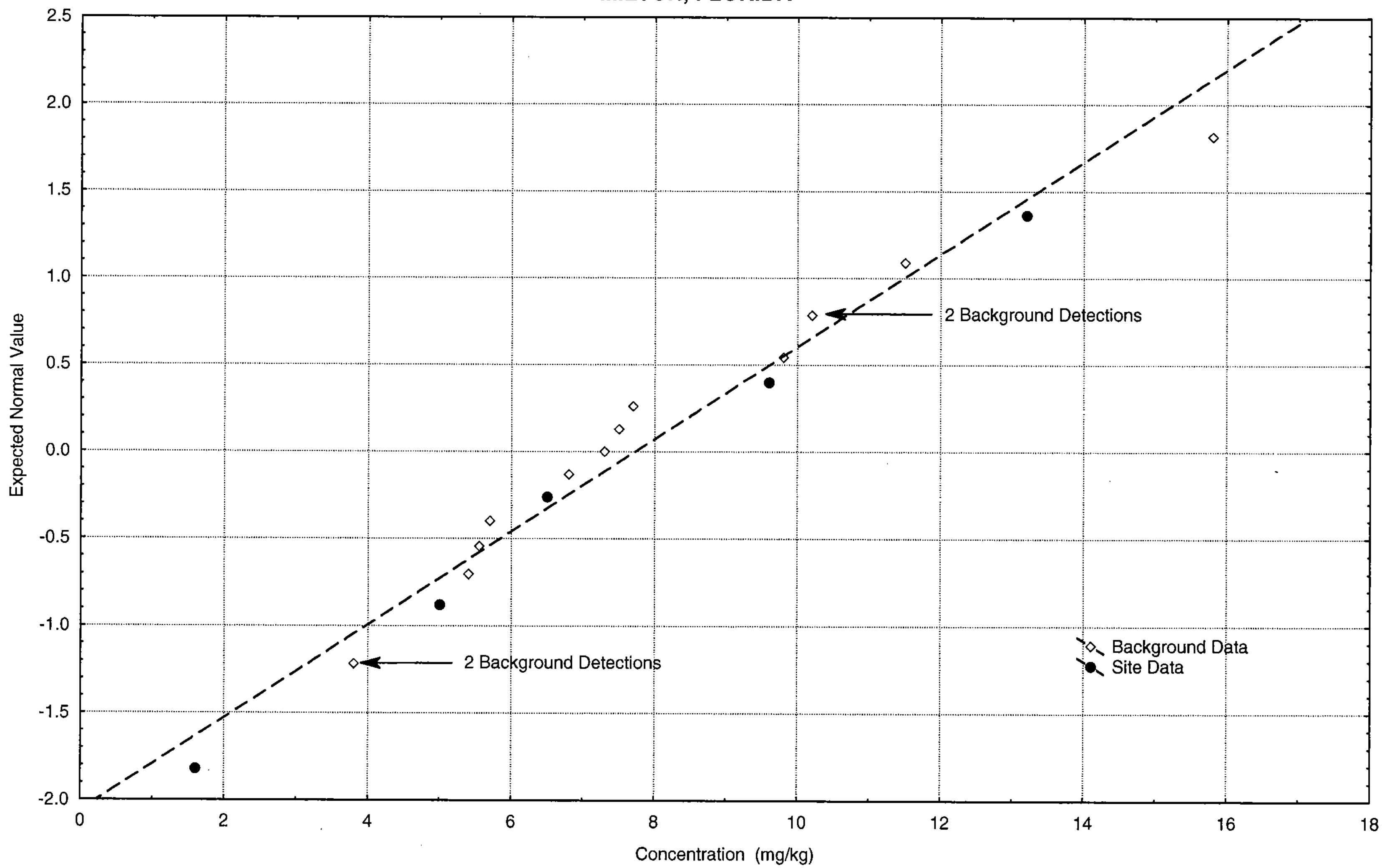
APPENDIX FIGURE A-7-2
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



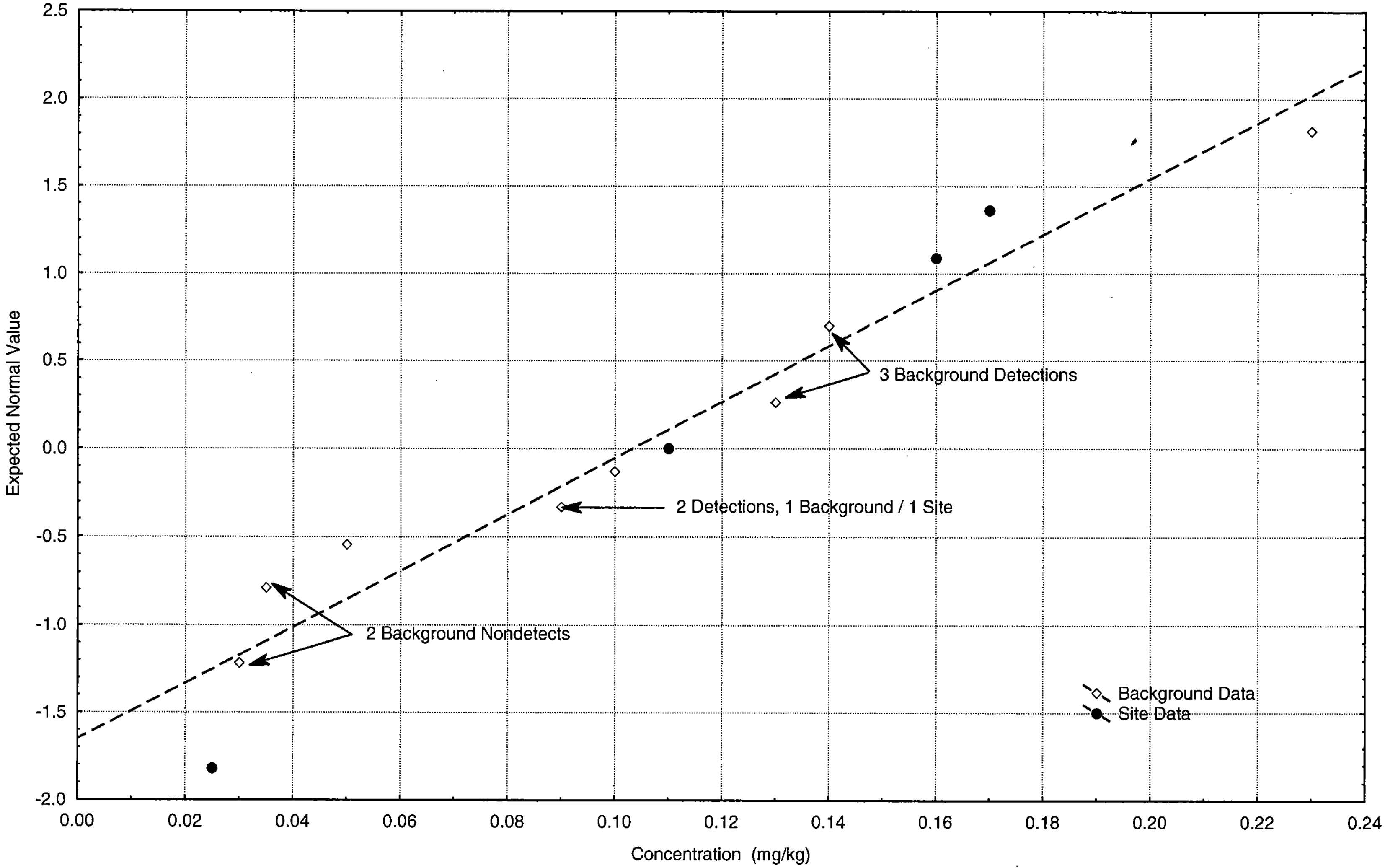
APPENDIX FIGURE A-7-3
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



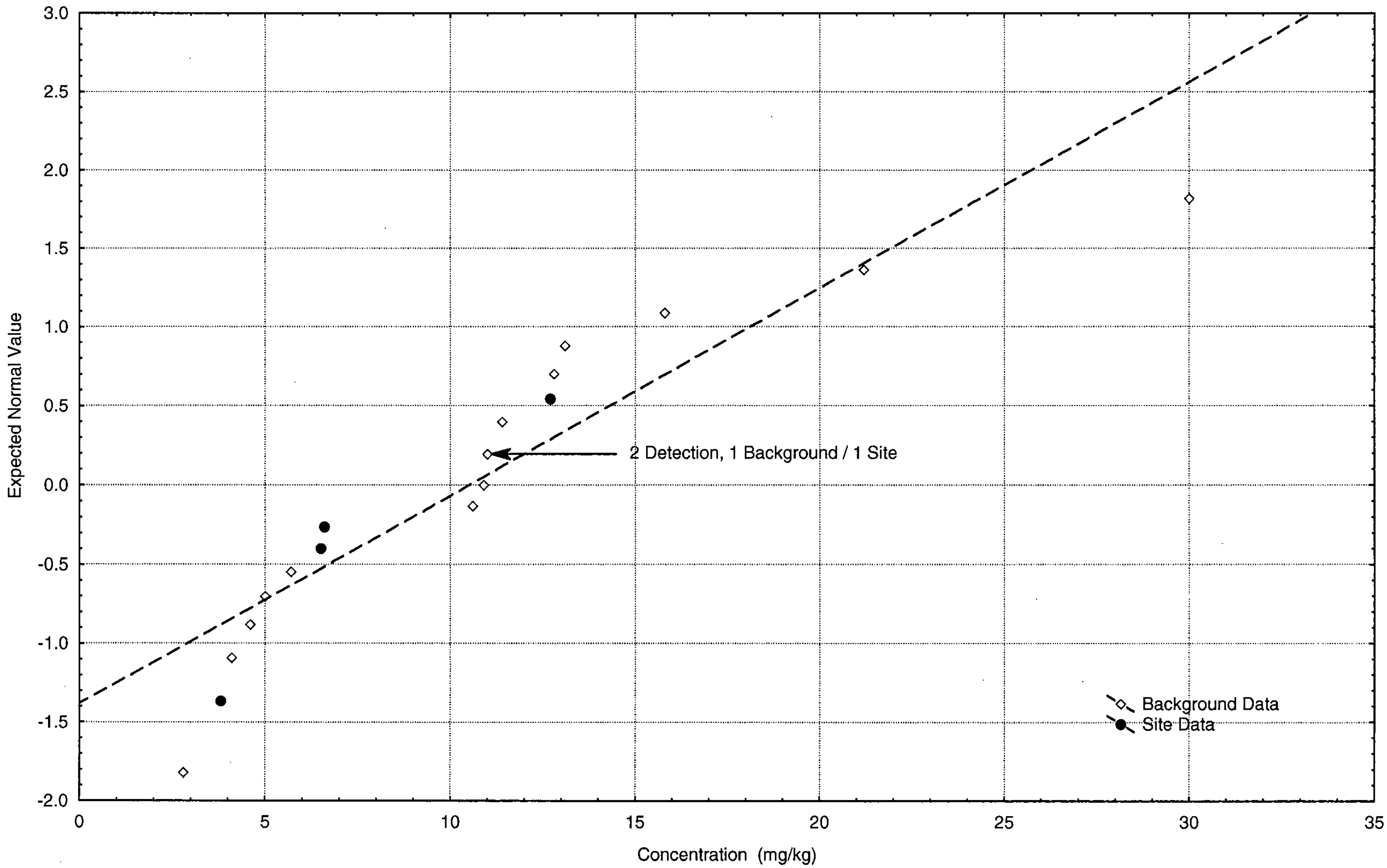
APPENDIX FIGURE A-7-4
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



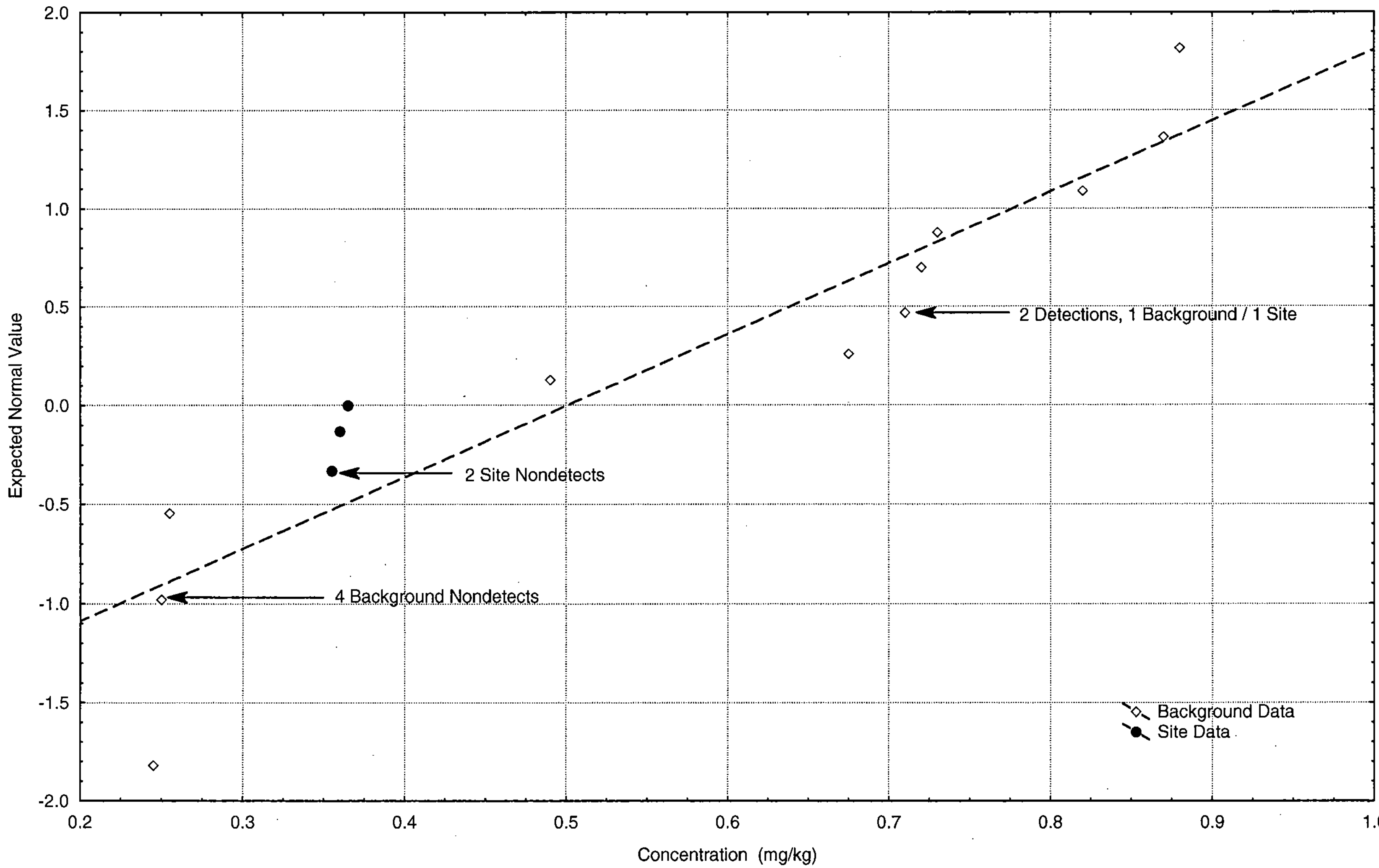
APPENDIX FIGURE A-7-5
NORMAL PROBABILITY PLOT - BERYLLIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



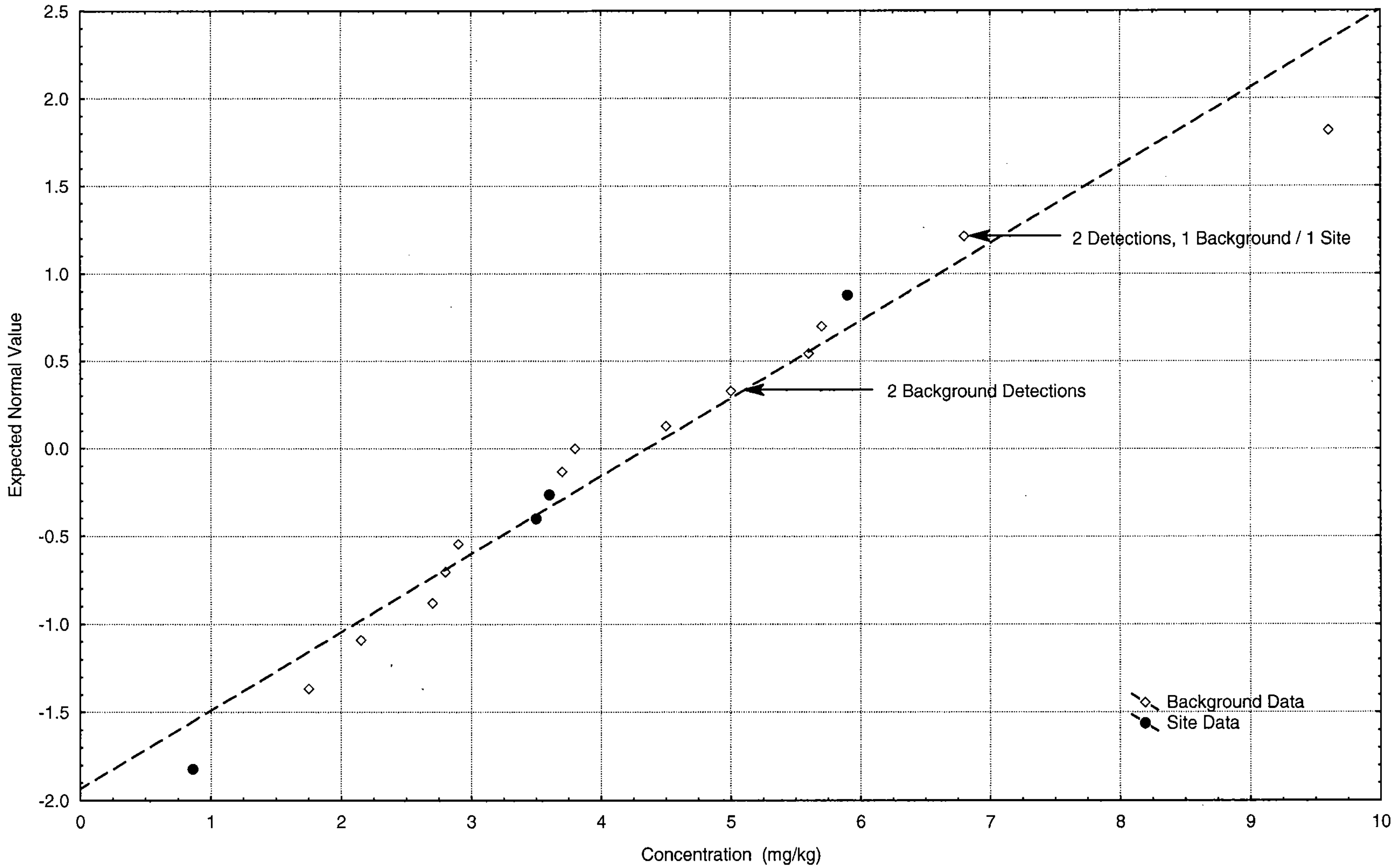
APPENDIX FIGURE A-7-6
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



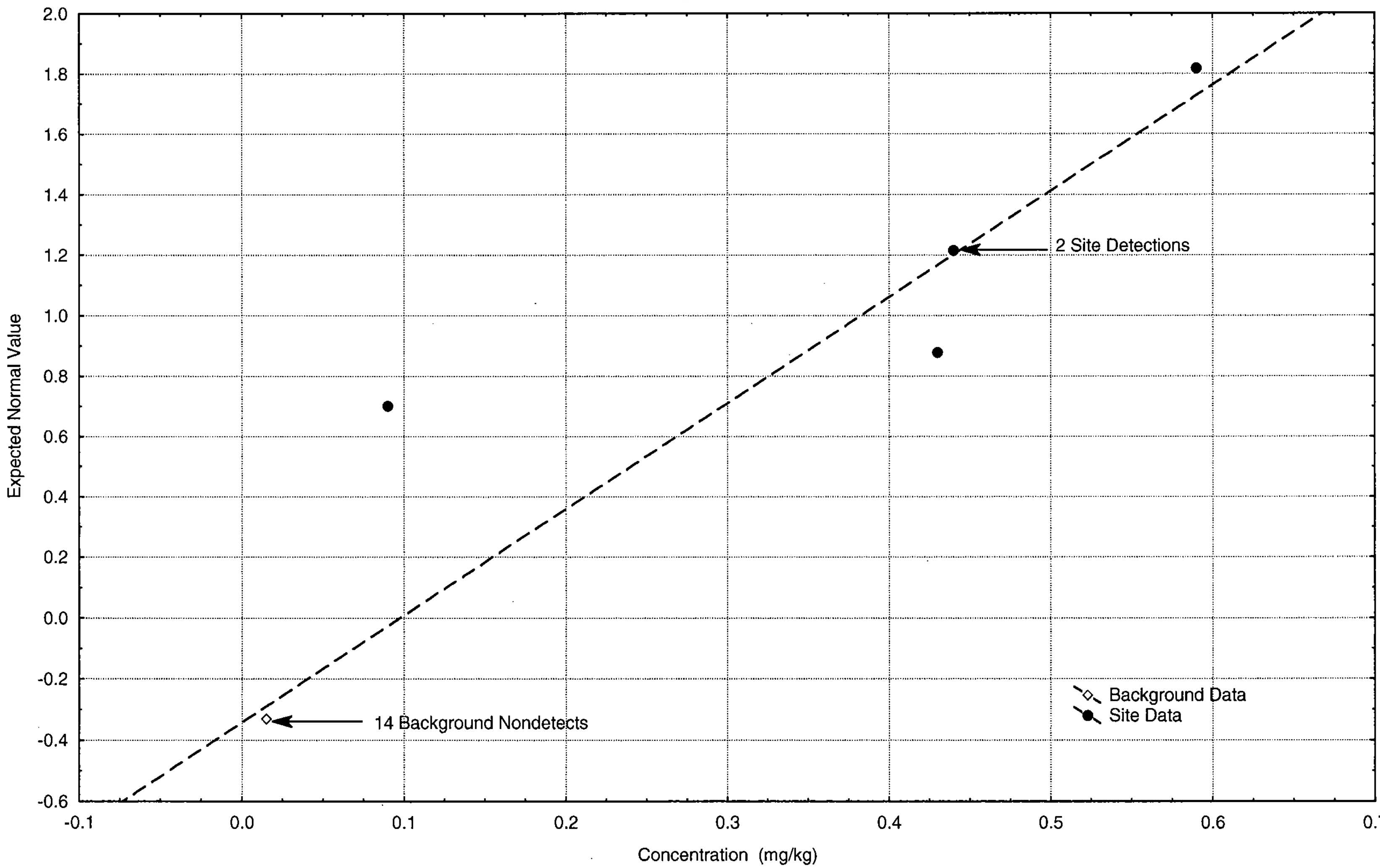
APPENDIX FIGURE A-7-7
NORMAL PROBABILITY PLOT - COBALT - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



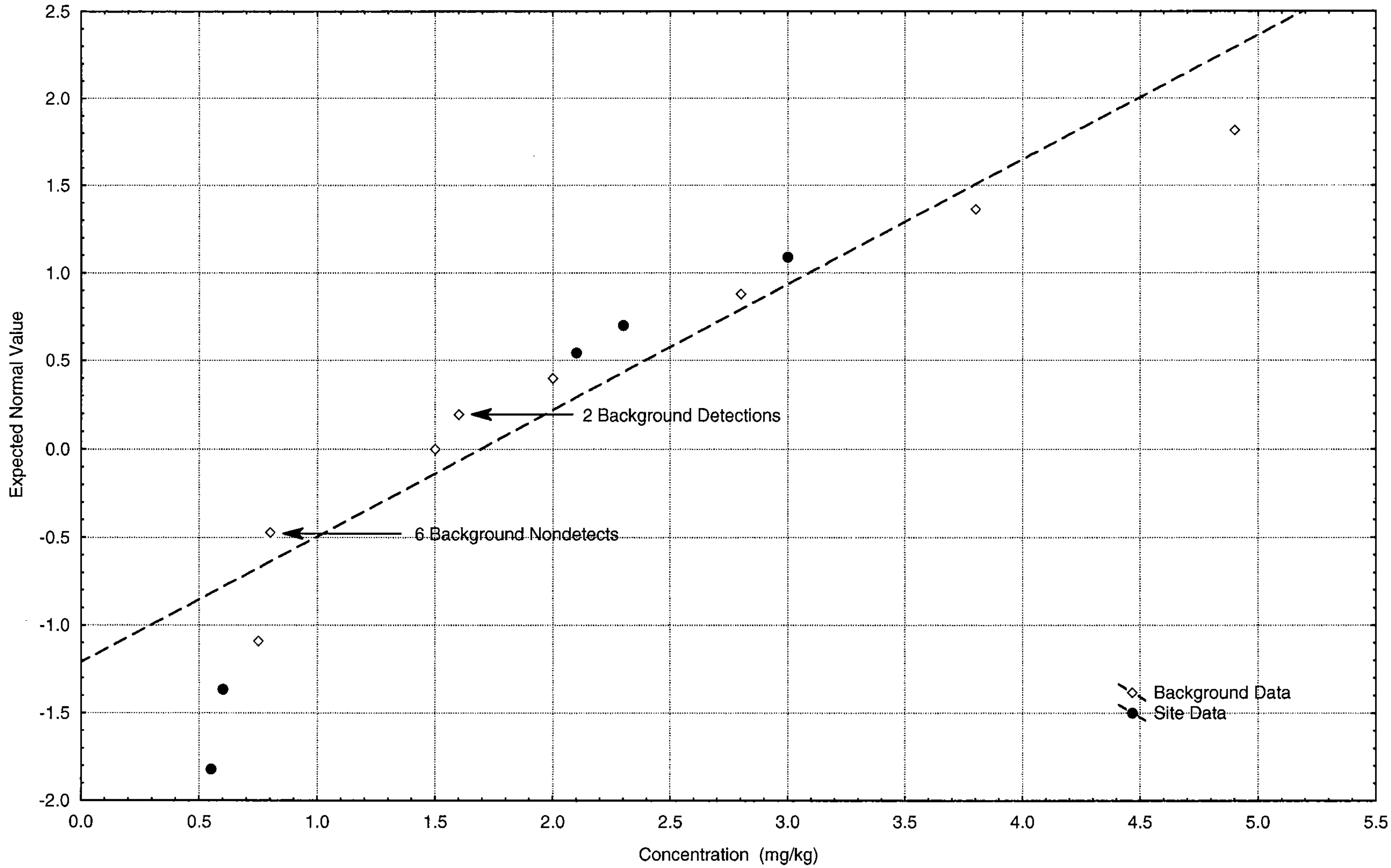
APPENDIX FIGURE A-7-8
NORMAL PROBABILITY PLOT - COPPER - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-7-9
NORMAL PROBABILITY PLOT - MERCURY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-7-10
NORMAL PROBABILITY PLOT - NICKEL - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.8

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 16, OPEN DISPOSAL AND BURNING AREA

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 UJ
1,2-DICHLOROETHANE	6 U	6 U	6 U	12 UJ	12 UJ	12 U	11 UJ	13 UJ	11 UJ	11 UJ	12 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
2-BUTANONE	11 U	11 U	12 U	12 UJ	12 UJ	12 U	11 UJ	13 UJ	11 UJ	11 UJ	12 UJ
2-HEXANONE	11 U	11 U	12 U	12 U	12 UJ	12 UJ	11 U	13 U	11 U	11 U	12 UJ
4-METHYL-2-PENTANONE	11 U	11 U	12 U	12 U	12 U	12 U	11 U	13 UJ	11 U	11 U	12 UJ
ACETONE	11 U	15 UJ	12 U	12 UJ	12 UJ	12 UJ	11 UJ	13 UJ	11 UJ	11 UJ	12 UJ
BENZENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
BROMOFORM	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
BROMOMETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
CARBON DISULFIDE	6 U	6 U	6 U	12 U	12 UJ	12 UJ	11 U	13 U	11 U	11 U	12 UJ
CARBON TETRACHLORIDE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
CHLOROBENZENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
CHLORODIBROMOMETHANE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
CHLOROETHANE	11 U	11 U	12 U	12 UJ	12 UJ	12 UJ	11 UJ	13 U	11 UJ	11 UJ	12 U
CHLOROFORM	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
CHLOROMETHANE	11 U	11 U	12 U	12 U	12 UJ	12 UJ	11 U	13 UJ	11 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
ETHYLBENZENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
METHYLENE CHLORIDE	11 UJ	6 UJ	10 UJ	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 UJ
STYRENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
TETRACHLOROETHENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
TOLUENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	1 J	12 U
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
TOTAL XYLENES	5 J	2 J	1 J	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
TRICHLOROETHENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
VINYL ACETATE	11 U	11 U	12 U								
VINYL CHLORIDE	11 U	11 U	12 U	12 U	12 UJ	12 UJ	11 U	13 UJ	11 U	11 U	12 U
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
1,2-DICHLOROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
1,3-DICHLOROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
1,4-DICHLOROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
1-METHYLNAPHTHALENE											
2,4,5-TRICHLOROPHENOL	1800 U	1800 U	2000 U	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
2,4,6-TRICHLOROPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2,4-DICHLOROPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2,4-DIMETHYLPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2,4-DINITROPHENOL	1800 U	1800 U	2000 U	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
2,4-DINITROTOLUENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2,6-DINITROTOLUENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2-CHLORONAPHTHALENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2-CHLOROPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2-METHYLNAPHTHALENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2-METHYLPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
2-NITROANILINE	1800 U	1800 UJ	2000 UJ	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
2-NITROPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
3,3'-DICHLOROBENZIDINE	730 U	760 U	820 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
3-NITROANILINE	1800 U	1800 UJ	2000 UJ	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	2000 U	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
4-BROMOPHENYL PHENYL ETHER	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
4-CHLORO-3-METHYLPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
4-CHLOROANILINE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
4-METHYLPHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
4-NITROANILINE	1800 UJ	1800 UJ	2000 UJ	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
4-NITROPHENOL	1800 U	1800 UJ	2000 UJ	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
ACENAPHTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
ACENAPHTHYLENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
ANTHRACENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
BENZO(A)ANTHRACENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	250 J
BENZO(A)PYRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	310 J
BENZO(B)FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	350 J
BENZO(G,H,I)PERYLENE	370 U	380 U	410 U	390 UJ	385 UJ	380 U	370 UJ	420 U	370 UJ	360 UJ	120 J
BENZO(K)FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	340 J
BENZOIC ACID	1800 U	1800 U	2000 U								
BENZYL ALCOHOL	370 U	380 U	410 U								
BIS(2-CHLOROETHOXY)METHANE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
BIS(2-CHLOROETHYL)ETHER	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	380 U	43 J	390 U	385 U	380 U	370 U	420 U	370 U	360 U	110 J
BUTYL BENZYL PHTHALATE	370 UJ	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
CHRYSENE	370 UJ	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	270 J
DI-N-BUTYL PHTHALATE	370 U	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
DI-N-OCTYL PHTHALATE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZO(A,H)ANTHRACENE	370 U	380 U	410 U	390 U	385 U	380 U	370 UJ	420 U	370 U	360 U	110 J
DIBENZOFURAN	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
DIETHYL PHTHALATE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
DIMETHYL PHTHALATE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	260 J
FLUORENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
HEXACHLOROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
HEXACHLOROBUTADIENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
HEXACHLOROCYCLOPENTADIENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 UJ	370 U	360 U	400 U
HEXACHLOROETHANE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
INDENO(1,2,3-CD)PYRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	240 J
ISOPHORONE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 UJ	370 U	360 U	400 U
N-NITROSODIPHENYLAMINE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
NAPHTHALENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
NITROBENZENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
PENTACHLOROPHENOL	1800 U	1800 U	2000 U	980 U	975 U	970 U	920 U	1100 U	920 U	900 U	1000 U
PHENANTHRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	52 J
PHENOL	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
PYRENE	370 UJ	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	170 J
Pesticides PCBs (ug/kg)											
4,4'-DDD	18 U	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	4.2 UJ	3.7 U	3.6 U	18 J
4,4'-DDE	18 U	5.5 J	5.5 J	3.2 J	2.6 J	2 J	3.7 U	4.2 UJ	3.7 U	3.6 U	53
4,4'-DDT	18 U	9.1 J	5.2 J	3.8 J	3.25 J	2.7 J	3.7 U	4.2 UJ	3.7 U	3.6 U	22
ALDRIN	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
ALPHA-BHC	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
ALPHA-CHLORDANE	89 U	92 U	99 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
AROCLOR-1016	89 U	92 U	99 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
AROCLOR-1221	89 U	92 U	99 U	79 U	78.5 UJ	78 UJ	74 U	86 UJ	74 U	73 U	410 U
AROCLOR-1232	89 U	92 U	99 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
AROCLOR-1242	89 U	92 U	99 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
AROCLOR-1248	89 U	92 U	99 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
AROCLOR-1254	180 U	180 U	200 U	39 U	38.5 UJ	38 UJ	37 U	36 J	37 U	36 U	200 U
AROCLOR-1260	180 U	180 U	200 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
BETA-BHC	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
DELTA-BHC	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
DIELDRIN	33	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	2.5 J	3.7 U	3.6 U	20 U
ENDOSULFAN I	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
ENDOSULFAN II	18 U	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	4.2 UJ	3.7 U	3.6 U	20 U
ENDOSULFAN SULFATE	18 U	18 U	20 U	3.9 UJ	3.85 UJ	3.8 UJ	3.7 UJ	4.2 UJ	3.7 UJ	3.6 UJ	20 UJ

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN	18 U	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	4.2 UJ	3.7 U	3.6 U	20 U
ENDRIN KETONE	18 U	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	4.2 UJ	3.7 U	3.6 U	20 U
GAMMA-BHC (LINDANE)	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
GAMMA-CHLORDANE	89 U	92 U	99 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
HEPTACHLOR	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
HEPTACHLOR EPOXIDE	8.9 U	9.2 U	9.9 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
METHOXYCHLOR	89 U	92 U	99 U	20 U	20 UJ	20 UJ	19 U	22 UJ	19 U	18 U	100 U
TOTAL DDT	0 U	14.6 J	10.7 J	7 J	5.85 J	4.7 J	0 U	0 U	0 U	0 U	93 J
TOTAL DDT HALFND	27	23.6 J	20.7 J	8.95 J	7.775 J	6.6 J	5.55	6.3	5.55	5.4	93 J
TOTAL PCBs	0 U	0 U	0 U	0 U	0 U	0 U	0 U	36 J	0 U	0 U	0 U
TOTAL PCBs HALFND	402.5	410	447.5	156.5	154.75	153	148	184 J	148	144.5	810
TOXAPHENE	180 U	180 U	200 U	200 U	200 UJ	200 UJ	190 U	220 UJ	190 U	180 U	1000 U
Inorganics (mg/kg)											
ALUMINUM	10900	18600	14200	4250 J	5045 J	5840 J	6570 J	10600 J	11100 J	5610 J	8820 J
ANTIMONY	2.8 U	2.7 U	3 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	5.9 J
ARSENIC	1.9 J	1.4 J	3.1	0.94 J	1.07 J	1.2 J	1.6 J	2.5 J	1.5 J	1.3 J	5.6
BARIUM	19.4 J	14.7 J	42.9 J	13.2 J	13.4 J	13.6 J	11.2 J	42.8 J	13.1 J	6.1 J	257
BERYLLIUM	0.12 J	0.12 J	0.12 J	0.09 J	0.09 J	1 U	1 U	0.11 J	0.09 J	0.06 J	1 U
CADMIUM	0.63 U	0.61 U	1.6	0.28 J	0.29 J	0.3 J	0.36 J	0.43 J	0.25 J	1 U	7.6
CALCIUM	427 J	345 J	1180 J	210 J	191.5 J	173 J	260 J	907 J	80.8 J	70.8 J	2350
CHROMIUM	10.5	14.7	14.9	4	4.9	5.8	4.5	11.2	10.3	4	29.2
COBALT	1.3 J	0.95 J	1.7 J	10 U	10 U	10 U	10 U	1.4 J	10 U	0.69 J	4.1 J
COPPER	9.7	8.3	50.8	4.8 J	4.8 J	5 UJ	3.8 J	13.2	4.4 J	5 UJ	202
IRON	6300	8150	13600	2340 J	2625 J	2910 J	4090 J	5450 J	5160 J	3220 J	30300
LEAD	76	6.7 J	121	7.8 J	7.65 J	7.5 J	6.5 J	74.3 J	4.4 J	5.2 J	759
MAGNESIUM	106 J	134 J	228 J	103 J	126.5 J	150 J	91.3 J	264 J	127 J	82.7 J	443 J
MANGANESE	80.3	19.2	228	185	168	151	97.2	123	95.8	112	275
MERCURY	0.08 U	0.08 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.65 J
NICKEL	2.4 U	2.4 U	5.5 J	8 U	1.9 J	1.9 J	8 U	2.7 J	2.3 J	8 U	17.7
POTASSIUM	137 U	133 U	230 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 U	180 J
SELENIUM	0.42 U	0.41 U	0.46 U	0.19 J	0.19 J	1 U	1 U	1 U	0.15 J	0.15 J	1 U
SILVER	0.34 U	0.33 U	0.87 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	7.1
SODIUM	196 J	189 J	232 J	129 J	129 J	1000 UJ	120 J	157 J	1000 UJ	1000 UJ	361 J
THALLIUM	0.47 U	0.46 U	0.5 U	2 U	2 U	2 U	2 U	0.18 J	0.13 J	2 U	2 U
VANADIUM	23.2	28.9	22.7	6.8 J	7.7 J	8.6 J	10.2 J	19.4	17.5	7.3 J	14.4
ZINC	22.7	12.5	128	6.4	6.65	6.9	8	59.2	6.3	4.8	773
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.25 U	0.24 U	0.27 U	0.12 J	0.12 J	0.12 J	0.5 U	0.13 J	0.5 U	0.14 J	0.5 UJ

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
1,1-DICHLOROETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
1,1-DICHLOROETHENE	12 U	11 U	11 UJ	11 UJ	11 U	12 UJ	13 U	11 U	11 UJ	11 U	12 UJ
1,2-DICHLOROETHANE	12 UJ	11 UJ	11 U	11 UJ	11 UJ	12 U	13 UJ	11 UJ	11 U	11 UJ	12 U
1,2-DICHLOROPROPANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
2-BUTANONE	12 UJ	11 UJ	11 U	11 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 U	11 UJ	12 UJ
2-HEXANONE	12 U	11 U	11 U	11 U	11 U	12 UJ	13 U	11 U	11 U	11 U	12 UJ
4-METHYL-2-PENTANONE	12 U	11 UJ	11 U	11 U	11 U	12 UJ	13 U	11 U	11 U	11 U	12 UJ
ACETONE	12 UJ	11 UJ	14 U	12.5 UJ	11 UJ	12 UJ	13 UJ	11 UJ	11 U	11 UJ	12 UJ
BENZENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
BROMODICHLOROMETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
BROMOFORM	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
BROMOMETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CARBON DISULFIDE	12 U	11 U	11 UJ	11 UJ	11 U	12 UJ	13 U	11 U	11 UJ	11 U	12 UJ
CARBON TETRACHLORIDE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CHLOROBENZENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CHLORODIBROMOMETHANE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CHLOROETHANE	12 UJ	11 U	11 U	11 UJ	11 UJ	12 U	13 UJ	11 UJ	11 U	11 UJ	12 U
CHLOROFORM	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CHLOROMETHANE	12 U	11 UJ	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
ETHYLBENZENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
METHYLENE CHLORIDE	12 U	11 U	11 U	11 U	11 U	12 UJ	13 U	11 U	11 U	11 U	12 UJ
STYRENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TETRACHLOROETHENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TOLUENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TOTAL 1,2-DICHLOROETHENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TOTAL XYLENES	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TRICHLOROETHENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
VINYL ACETATE											
VINYL CHLORIDE	12 U	11 UJ	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
1,2-DICHLOROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
1,3-DICHLOROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
1,4-DICHLOROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
1-METHYLNAPHTHALENE											
2,4,5-TRICHLOROPHENOL	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
2,4,6-TRICHLOROPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2,4-DICHLOROPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2,4-DIMETHYLPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2,4-DINITROPHENOL	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
2,4-DINITROTOLUENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2,6-DINITROTOLUENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2-CHLORONAPHTHALENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2-CHLOROPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2-METHYLNAPHTHALENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2-METHYLPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
2-NITROANILINE	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
2-NITROPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
3,3'-DICHLOROBENZIDINE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
3-NITROANILINE	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
4-BROMOPHENYL PHENYL ETHER	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
4-CHLORO-3-METHYLPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
4-CHLOROANILINE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
4-METHYLPHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
4-NITROANILINE	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
4-NITROPHENOL	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 UJ
ACENAPHTHENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
ACENAPHTHYLENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
ANTHRACENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
BENZO(A)ANTHRACENE	400 UJ	67 J	350 U	350 U	350 U	56 J	420 U	370 U	370 U	360 U	400 U
BENZO(A)PYRENE	400 UJ	130 J	350 U	350 U	350 U	71 J	120 J	370 U	370 U	360 U	400 U
BENZO(B)FLUORANTHENE	400 UJ	300 J	350 U	350 U	350 U	86 J	420 U	370 U	370 U	360 U	400 U
BENZO(G,H,I)PERYLENE	400 UJ	380 UJ	350 U	350 U	350 U	380 U	490	370 U	370 U	360 U	400 U
BENZO(K)FLUORANTHENE	400 UJ	380 U	350 U	350 UJ	350 UJ	73 J	420 U	370 U	370 U	360 U	400 U
BENZOIC ACID											
BENZYL ALCOHOL											
BIS(2-CHLOROETHOXY)METHANE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
BIS(2-CHLOROETHYL)ETHER	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	50 J	380 U	350 U	58 J	58 J	78 J	420 U	370 U	370 U	360 U	45 J
BUTYL BENZYL PHTHALATE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
CHRYSENE	400 UJ	120 J	350 U	350 U	350 U	62 J	54 J	370 U	370 U	360 U	400 U
DI-N-BUTYL PHTHALATE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
DI-N-OCTYL PHTHALATE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZO(A,H)ANTHRACENE	400 UJ	380 UJ	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
DIBENZOFURAN	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
DIETHYL PHTHALATE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
DIMETHYL PHTHALATE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
FLUORANTHENE	400 UJ	86	350 U	350 U	350 U	59 J	420 U	370 U	370 U	360 U	400 U
FLUORENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
HEXACHLOROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
HEXACHLOROBUTADIENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
HEXACHLOROCYCLOPENTADIENE	400 UJ	380 U	350 UJ	350 UJ	350 U	380 U	420 UJ	370 UJ	370 U	360 U	400 U
HEXACHLOROETHANE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
INDENO(1,2,3-CD)PYRENE	400 UJ	90 J	350 U	350 U	350 U	380 U	62 J	370 U	370 U	360 U	400 U
ISOPHORONE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	400 UJ	380 U	350 UJ	350 UJ	350 U	380 U	420 UJ	370 UJ	370 U	360 U	400 U
N-NITROSODIPHENYLAMINE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
NAPHTHALENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
NITROBENZENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
PENTACHLOROPHENOL	1000 UJ	950 U	870 U	875 U	880 U	970 U	1100 U	920 U	920 U	900 U	1000 U
PHENANTHRENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
PHENOL	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
PYRENE	400 UJ	150	350 U	350 U	350 U	44 J	420 U	370 U	370 U	360 U	400 U
Pesticides PCBs (ug/kg)											
4,4'-DDD	4 U	7.2 U	3.5 UJ	5.25 UJ	7 U	2.1 J	4.2 UJ	3.7 UJ	3.7 U	3.6 U	4 U
4,4'-DDE	4 U	11	13 J	17.5 J	22	51	26 J	3.7 UJ	3.7 U	3.6 U	4 U
4,4'-DDT	4 U	16	6.4 J	7.7 J	9	28	7.1 J	3.7 UJ	3.7 U	3.6 U	4 U
ALDRIN	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
ALPHA-BHC	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
ALPHA-CHLORDANE	2.1 U	2.6 J	6.8 J	9.4 J	12 J	2 U	2.2 UJ	1.6 J	1.9 U	1.8 U	2 U
AROCLOR-1016	40 U	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1221	82 U	150 U	71 UJ	105.5 UJ	140 U	78 U	85 UJ	74 UJ	74 U	73 U	81 U
AROCLOR-1232	40 U	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1242	40 U	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1248	40 U	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1254	130	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1260	40 U	72 U	48 J	79 J	110 J	38 U	42 UJ	37 UJ	37 U	36 U	40 U
BETA-BHC	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
DELTA-BHC	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
DIELDRIN	9.2	17	33 J	46.5 J	60	3.8 U	2.9 J	7.2 J	3.7 U	3.6 U	4 U
ENDOSULFAN I	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
ENDOSULFAN II	4 U	7.2 U	3.5 UJ	5.25 UJ	7 U	3.8 U	4.2 UJ	3.7 UJ	3.7 U	3.6 U	4 U
ENDOSULFAN SULFATE	4 UJ	7.2 UJ	3.5 UJ	5.25 UJ	7 UJ	3.8 UJ	4.2 UJ	3.7 UJ	3.7 UJ	3.6 UJ	4 UJ

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SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN	4 U	7.2 U	3.5 UJ	5.25 UJ	7 U	3.8 U	4.2 UJ	3.7 UJ	3.7 U	3.6 U	4 U
ENDRIN KETONE	4 U	7.2 U	3.5 UJ	5.25 UJ	7 U	3.8 U	4.2 UJ	3.7 UJ	3.7 U	3.6 U	4 U
GAMMA-BHC (LINDANE)	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
GAMMA-CHLORDANE	2.1 U	2.2 J	4 J	5.95 J	7.9 J	2 U	2.2 UJ	1 J	1.9 U	1.8 U	2 U
HEPTACHLOR	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
HEPTACHLOR EPOXIDE	2.1 U	3.7 U	1.8 UJ	2.7 UJ	3.6 U	2 U	2.2 UJ	1.9 UJ	1.9 U	1.8 U	2 U
METHOXYCHLOR	21 U	37 U	18 UJ	27 UJ	36 U	20 U	22 UJ	19 UJ	19 U	18 U	20 U
TOTAL DDT	0 U	27	19.4 J	25.2 J	31	81.1 J	33.1 J	0 U	0 U	0 U	0 U
TOTAL DDT HALFND	6	30.6	21.15 J	27.825 J	34.5	81.1 J	35.2 J	5.55	5.55	5.4	6
TOTAL PCBs	130	0 U	48 J	79 J	110 J	0 U	0 U	0 U	0 U	0 U	0 U
TOTAL PCBs HALFND	271	291	171 J	263 J	345 J	153	168.5	148	148	144.5	160.5
TOXAPHENE	210 U	370 U	180 UJ	270 UJ	360 U	200 U	220 UJ	190 UJ	190 U	180 U	200 U
Inorganics (mg/kg)											
ALUMINUM	9300 J	8050 J	2000 J	1890 J	1780 J	8210 J	13900 J	9130 J	8050 J	5010 J	7280 J
ANTIMONY	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	3.4	2.8	0.76 J	0.7 J	0.64 J	12.1	6.6	1.6 J	1.5 J	1.4 J	2.2 J
BARIUM	13.3 J	55.7	4.9 J	4.45 J	4 J	92.5	39.5 J	12.3 J	19.7 J	7.8 J	10.7 J
BERYLLIUM	0.11 J	0.11 J	1 U	1 U	1 U	0.06 J	0.23 J	0.1 J	0.09 J	0.06 J	1 U
CADMIUM	0.36 J	0.67 J	1 U	0.23 J	0.23 J	5.3	2.1	0.21 J	0.21 J	0.23 J	0.38 J
CALCIUM	302 J	1080 J	101 J	100.4 J	99.8 J	1230	658 J	441 J	670 J	96.5 J	327 J
CHROMIUM	11	11.3	3.9	3.6	3.3	24.5	19.3	8	5.4	3.2	5.5
COBALT	10 U	10 U	10 U	10 U	10 U	3.9 J	1.2 J	0.7 J	0.85 J	10 U	10 U
COPPER	5.2 J	20	10.2	9.4	8.6	139	80.1	5.6	6.1	2.9 J	5.4 J
IRON	6380 J	5370 J	1470 J	1390 J	1310 J	48900	13500 J	4760 J	4030	2920 J	5290
LEAD	19.8 J	173 J	13.5 J	12.95 J	12.4 J	436	128 J	60 J	22.9	4.4 J	15.8
MAGNESIUM	54.6 J	298 J	38.5 J	34.2 J	29.9 J	255 J	168 J	142 J	186 J	84.2 J	95.8 J
MANGANESE	21.5	120	5.6	5.25	4.9	270	88.1	54.7	372	253	32.3
MERCURY	0.1 U	0.1 U	0.2	0.185	0.17	0.18 J	0.11	0.1 U	0.05 J	0.1 U	0.06 J
NICKEL	8 U	5.1 J	8 U	8 U	8 U	26	5.9 J	8 U	4.1 J	8 U	8 U
POTASSIUM	1000 UJ	1000 UJ	1000 U	77.6 J	77.6 J	107 J	1000 UJ	1000 UJ	69.7 J	1000 U	76.9 J
SELENIUM	1 U	1 U	0.13 J	0.13 J	1 U	1 U	0.19 J	1 U	0.15 J	0.2 J	1 U
SILVER	2 U	2 U	4.1	3.85	3.6	2.2 J	1.3 J	2 U	2 U	2 U	2 U
SODIUM	149 J	124 J	139 J	128.5 J	118 J	189 J	145 J	117 J	181 J	114 J	186 J
THALLIUM	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	28.2	21.8	3.4 J	3.3 J	3.2 J	16.7	26.5	14	11.2	7 J	13.3
ZINC	13.1	161	4.1 J	3.75 J	3.4 J	488	177	16.3	8	4.7	16.7
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.5 U	0.18 J	0.1 J	0.135 J	0.17 J	0.5 UJ	0.16 J	0.5 U	0.5 U	0.51 J	0.5 UJ

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)									
1,1,1-TRICHLOROETHANE	11 U								
1,1,2,2-TETRACHLOROETHANE	11 U								
1,1,2-TRICHLOROETHANE	11 U								
1,1-DICHLOROETHANE	11 U								
1,1-DICHLOROETHENE	11 UJ								
1,2-DICHLOROETHANE	11 U								
1,2-DICHLOROPROPANE	11 U								
2-BUTANONE	11 UJ								
2-HEXANONE	11 UJ								
4-METHYL-2-PENTANONE	11 UJ								
ACETONE	11 UJ								
BENZENE	11 U								
BROMODICHLOROMETHANE	11 U								
BROMOFORM	11 U								
BROMOMETHANE	11 U								
CARBON DISULFIDE	11 UJ								
CARBON TETRACHLORIDE	11 U								
CHLOROBENZENE	11 U								
CHLORODIBROMOMETHANE	11 U								
CHLOROETHANE	11 U								
CHLOROFORM	11 U								
CHLOROMETHANE	11 U								
CIS-1,3-DICHLOROPROPENE	11 U								
ETHYLBENZENE	11 U								
METHYLENE CHLORIDE	11 UJ								
STYRENE	11 U								
TETRACHLOROETHENE	11 U								
TOLUENE	11 U								
TOTAL 1,2-DICHLOROETHENE	11 U								
TOTAL XYLENES	11 U								
TRANS-1,3-DICHLOROPROPENE	11 U								
TRICHLOROETHENE	11 U								
VINYL ACETATE									
VINYL CHLORIDE	11 U								
Semivolatile Organics (ug/kg)									
1,2,4-TRICHLOROBENZENE	360 U								
1,2-DICHLOROBENZENE	360 U								
1,3-DICHLOROBENZENE	360 U								
1,4-DICHLOROBENZENE	360 U								

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
1-METHYLNAPHTHALENE		41	10 U	11 U	22 U	11 U	11 U	24 U	23 U
2,4,5-TRICHLOROPHENOL	910 U								
2,4,6-TRICHLOROPHENOL	360 U								
2,4-DICHLOROPHENOL	360 U								
2,4-DIMETHYLPHENOL	360 U								
2,4-DINITROPHENOL	910 U								
2,4-DINITROTOLUENE	360 U								
2,6-DINITROTOLUENE	360 U								
2-CHLORONAPHTHALENE	360 U								
2-CHLOROPHENOL	360 U								
2-METHYLNAPHTHALENE	360 U	10 U	9.8 U	10 U	22 U	9.9 U	10 U	24 U	23 U
2-METHYLPHENOL	360 U								
2-NITROANILINE	910 U								
2-NITROPHENOL	360 U								
3,3'-DICHLOROBENZIDINE	360 U								
3-NITROANILINE	910 U								
4,6-DINITRO-2-METHYLPHENOL	910 U								
4-BROMOPHENYL PHENYL ETHER	360 U								
4-CHLORO-3-METHYLPHENOL	360 U								
4-CHLOROANILINE	360 U								
4-METHYLPHENOL	360 U								
4-NITROANILINE	910 U								
4-NITROPHENOL	910 U								
ACENAPHTHENE	360 U	7.6 U	7 U	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
ACENAPHTHYLENE	360 U	7.6 U	7	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
ANTHRACENE	360 U	7.6 U	7 U	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
BENZO(A)ANTHRACENE	360 U	36	24	185	7.8 J	18	14	3.2 J	3.3 J
BENZO(A)PYRENE	360 U	57	47	217	19	7.1 U	7.3 U	12 U	5.3 J
BENZO(B)FLUORANTHENE	360 U	60	57	226	14	8.4	7 J	12 U	12 U
BENZO(G,H,I)PERYLENE	360 U	50	74	214	17	7.1 U	14	4.7 J	6 J
BENZO(K)FLUORANTHENE	360 U	20	26	102	7.7 J	7.1 U	7.3 U	12 U	12 U
BENZOIC ACID									
BENZYL ALCOHOL									
BIS(2-CHLOROETHOXY)METHANE	360 U								
BIS(2-CHLOROETHYL)ETHER	360 U								
BIS(2-ETHYLHEXYL)PHTHALATE	48 J								
BUTYL BENZYL PHTHALATE	360 U								
CHRYSENE	360 U	42	25	159	7.2 J	9.3	6.3 J	12 U	4.4 J
DI-N-BUTYL PHTHALATE	360 U								
DI-N-OCTYL PHTHALATE	360 U								

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZO(A,H)ANTHRACENE	360 U	7.6 U	7 U	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
DIBENZOFURAN	360 U								
DIETHYL PHTHALATE	360 U								
DIMETHYL PHTHALATE	360 U								
FLUORANTHENE	360 U	39	18	169	11	12	11	12 U	12 U
FLUORENE	360 U	7.6 U	7 U	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
HEXACHLOROBENZENE	360 U								
HEXACHLOROBUTADIENE	360 U								
HEXACHLOROCYCLOPENTADIENE	360 U								
HEXACHLOROETHANE	360 U								
INDENO(1,2,3-CD)PYRENE	360 U	48	38	199	15	11	8.1	4.5 J	5.8 J
ISOPHORONE	360 U								
N-NITROSO-DI-N-PROPYLAMINE	360 U								
N-NITROSODIPHENYLAMINE	360 U								
NAPHTHALENE	360 U	7.6 U	27	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
NITROBENZENE	360 U								
PENTACHLOROPHENOL	910 U								
PHENANTHRENE	360 U	14	7 U	34	20	4.9 J	7.3 U	4.6 J	12 U
PHENOL	360 U								
PYRENE	360 U	20	5.9 J	93	15	5.3 J	24	12 U	12 U
Pesticides PCBs (ug/kg)									
4,4'-DDD	3.6 U								
4,4'-DDE	3.6 U								
4,4'-DDT	3.6 U								
ALDRIN	1.9 U								
ALPHA-BHC	1.9 U								
ALPHA-CHLORDANE	1.9 U								
AROCLOR-1016	36 U								
AROCLOR-1221	74 U								
AROCLOR-1232	36 U								
AROCLOR-1242	36 U								
AROCLOR-1248	36 U								
AROCLOR-1254	36 U								
AROCLOR-1260	36 U								
BETA-BHC	1.9 U								
DELTA-BHC	1.9 U								
DIELDRIN	3.6 U								
ENDOSULFAN I	1.9 U								
ENDOSULFAN II	3.6 U								
ENDOSULFAN SULFATE	3.6 UJ								

APPENDIX TABLE A-8-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN	3.6 U								
ENDRIN KETONE	3.6 U								
GAMMA-BHC (LINDANE)	1.9 U								
GAMMA-CHLORDANE	1.9 U								
HEPTACHLOR	1.9 U								
HEPTACHLOR EPOXIDE	1.9 U								
METHOXYCHLOR	19 U								
TOTAL DDT	0 U								
TOTAL DDT HALFND	5.4								
TOTAL PCBs	0 U								
TOTAL PCBs HALFND	145								
TOXAPHENE	190 U								
Inorganics (mg/kg)									
ALUMINUM	4320 J								
ANTIMONY	12 UJ								
ARSENIC	1.3 J								
BARIUM	6.7 J								
BERYLLIUM	1 U								
CADMIUM	0.26 J								
CALCIUM	158 J								
CHROMIUM	3.5								
COBALT	10 U								
COPPER	5.8								
IRON	3070								
LEAD	29.6								
MAGNESIUM	56.6 J								
MANGANESE	34.3								
MERCURY	0.06 J								
NICKEL	2.5 J								
POTASSIUM	1000 U								
SELENIUM	1 U								
SILVER	2 U								
SODIUM	170 J								
THALLIUM	2 U								
VANADIUM	7.3 J								
ZINC	14.7								
Miscellaneous Parameters (mg/kg)									
CYANIDE	0.5 UJ								

APPENDIX TABLE A-8-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
2-BUTANONE	11 U	11 U	12 UJ	12 UJ	12 UJ	19	11 U
2-HEXANONE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
ACETONE	130 UJ	11 UJ	150 UJ	145 UJ	140 UJ	87 J	11 UJ
BENZENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
BROMOFORM	11 U	11 U	12 U	12 U	12 U	12 U	11 U
BROMOMETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CARBON DISULFIDE	26	5 J	13	11 J	9 J	1 J	5 J
CARBON TETRACHLORIDE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROBENZENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROFORM	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
ETHYLBENZENE	11 U	11 U	2 J	2 J	12 U	12 U	11 U
METHYLENE CHLORIDE	120 UJ	31 UJ	150 J	86.5 J	46 UJ	19 UJ	33 UJ
STYRENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
TETRACHLOROETHENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
TOLUENE	1 J	11 U	12 U	12 U	12 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
TOTAL XYLENES	11 J	3 J	7 J	6 J	5 J	2 J	4 J
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
TRICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
VINYL CHLORIDE	11 U	11 U	12 U	12 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
1,2-DICHLOROBENZENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
1,3-DICHLOROBENZENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
1,4-DICHLOROBENZENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2,4,5-TRICHLOROPHENOL	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U

APPENDIX TABLE A-8-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2,4-DICHLOROPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2,4-DIMETHYLPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2,4-DINITROPHENOL	900 U	910 UJ	980 U	1040 U	1100 U	990 U	920 U
2,4-DINITROTOLUENE	370 UJ	370 U	400 U	415 U	430 U	410 UJ	380 UJ
2,6-DINITROTOLUENE	370 UJ	370 U	400 U	415 U	430 U	410 UJ	380 UJ
2-CHLORONAPHTHALENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2-CHLOROPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2-METHYLNAPHTHALENE	39 J	370 U	400 U	415 U	430 U	410 U	380 U
2-METHYLPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
2-NITROANILINE	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
2-NITROPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
3,3'-DICHLOROBENZIDINE	370 U	370 UJ	400 U	415 U	430 U	410 U	380 U
3-NITROANILINE	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
4,6-DINITRO-2-METHYLPHENOL	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	400 U	415 U	430 U	410 U	380 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
4-CHLOROANILINE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
4-METHYLPHENOL	370 U	370 U	400 U	415 U	430 U	410 U	380 U
4-NITROANILINE	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
4-NITROPHENOL	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
ACENAPHTHENE	370 U	370 U	400 U	415 U	430 U	77 J	380 U
ACENAPHTHYLENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
ANTHRACENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
BENZO(A)ANTHRACENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
BENZO(A)PYRENE	370 U	370 U	400 U	415 U	430 U	44 J	380 U
BENZO(B)FLUORANTHENE	370 U	370 U	400 U	415 U	430 U	77 J	380 U
BENZO(G,H,I)PERYLENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
BENZO(K)FLUORANTHENE	370 UJ	370 U	400 U	415 U	430 U	48 J	380 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	400 U	415 U	430 U	410 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	370 U	400 UJ	415 UJ	430 UJ	150 J	39 J
BUTYL BENZYL PHTHALATE	370 UJ	370 U	400 UJ	415 UJ	430 UJ	410 U	380 U
CHRYSENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
DI-N-BUTYL PHTHALATE	370 UJ	370 UJ	400 UJ	415 UJ	430 UJ	410 UJ	380 UJ
DI-N-OCTYL PHTHALATE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
DIBENZOFURAN	370 U	370 U	400 U	415 U	430 U	410 U	380 U
DIETHYL PHTHALATE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
DIMETHYL PHTHALATE	370 U	370 U	400 U	415 U	430 U	410 U	380 U

APPENDIX TABLE A-8-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	120 J	370 U	400 U	415 U	430 U	270 J	380 U
FLUORENE	370 U	370 U	400 U	415 U	430 U	110 J	380 U
HEXACHLOROBENZENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
HEXACHLOROBUTADIENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
HEXACHLOROETHANE	370 UJ	370 U	400 U	415 U	430 U	410 U	380 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
ISOPHORONE	370 UJ	370 U	400 UJ	415 UJ	430 UJ	410 UJ	380 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	400 UJ	415 UJ	430 UJ	410 U	380 U
N-NITROSODIPHENYLAMINE	370 U	370 U	400 U	415 U	430 U	410 U	380 U
NAPHTHALENE	39 J	370 U	400 U	415 U	430 U	410 U	380 U
NITROBENZENE	370 U	370 U	400 UJ	415 UJ	430 UJ	410 UJ	380 UJ
PENTACHLOROPHENOL	900 U	910 U	980 U	1040 U	1100 U	990 U	920 U
PHENANTHRENE	58 J	370 U	400 U	415 U	430 U	340 J	380 U
PHENOL	370 U	370 UJ	400 U	415 U	430 U	410 U	380 U
PYRENE	77 J	370 U	400 U	415 U	430 U	190 J	380 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	2.2 J	3.7 UJ	4 U	4.15 U	4.3 U	36 J	4.9 J
4,4'-DDE	1.8 J	3.7 UJ	4 U	4.15 U	4.3 U	30 J	83
4,4'-DDT	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	5.7 J	52
ALDRIN	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
ALPHA-BHC	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
ALPHA-CHLORDANE	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
AROCLOR-1016	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
AROCLOR-1221	75 U	76 UJ	82 U	85 U	88 U	83 UJ	150 U
AROCLOR-1232	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
AROCLOR-1242	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
AROCLOR-1248	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
AROCLOR-1254	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
AROCLOR-1260	37 U	37 UJ	40 U	41.5 U	43 U	41 UJ	76 U
BETA-BHC	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
DELTA-BHC	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
DIELDRIN	1.6 J	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
ENDOSULFAN I	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
ENDOSULFAN II	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
ENDOSULFAN SULFATE	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
ENDRIN	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
ENDRIN KETONE	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
GAMMA-BHC (LINDANE)	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
GAMMA-CHLORDANE	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U

APPENDIX TABLE A-8-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
HEPTACHLOR EPOXIDE	1.9 U	1.9 UJ	2.1 U	2.15 U	2.2 U	2.1 UJ	3.9 U
METHOXYCHLOR	19 U	19 UJ	21 U	21.5 U	22 U	21 UJ	39 U
TOXAPHENE	190 U	190 UJ	210 U	215 U	220 U	210 UJ	390 U
Inorganics (mg/kg)							
ALUMINUM	17000	15400	29000	24250	19500	11000	17300
ANTIMONY	2.5 J	2.4 U	2.6 UJ	2.6 UJ	2.6 UJ	6.7 J	5.9 J
ARSENIC	2.7	1.5 J	5.1 J	5.45 J	5.8 J	15.1	11
BARIUM	36 J	35 J	21 J	20 J	19 J	175	122
BERYLLIUM	0.18 J	0.21 J	0.23 J	0.26 J	0.29 J	0.19 J	0.19 J
CADMIUM	2.4 J	0.67 U	0.74 U	0.735 U	0.73 U	9	8.7
CALCIUM	877 J	254 J	478 UJ	510 UJ	542 UJ	5870	1370
CHROMIUM	16.6	10.5	32.5 J	29.9 J	27.3 J	24.7	36.9
COBALT	1.1 J	1.2 J	2.4 J	1.9 J	1.4 J	4.5 J	9.6 J
COPPER	16.2	4.8 J	13.7	10.8	7.9	143	3620
IRON	8440	6670	21700	19650	17600	37500	74800
LEAD	74.6	6.8	17.3 J	15.95 J	14.6 J	766	567
MAGNESIUM	243 J	293 J	211 J	198 J	185 J	586 J	400 J
MANGANESE	93.1	231	54	46.95	39.9	297	638
MERCURY	0.29 J	0.43 J	0.14 UJ	0.12 UJ	0.1 UJ	0.25 J	0.17 J
NICKEL	4.4 J	4.4 J	4.4 J	3.35 J	2.3 J	24.3	35.9
POTASSIUM	258 J	153 U	270 J	313 J	356 J	412 J	166 J
SELENIUM	0.47 U	0.47 U	0.51 R	0.51 R	0.51 R	0.55 U	0.48 U
SILVER	0.79 J	0.46 U	0.64 UJ	0.67 UJ	0.7 UJ	4.3	3.4
SODIUM	243 J	207 J	223 UJ	224 UJ	225 UJ	514 J	332 J
THALLIUM	0.35 U	0.36 U	0.39 UJ	0.39 UJ	0.39 UJ	0.42 U	0.37 U
VANADIUM	25	19.1	63.3	65.4	67.5	19	27.9
ZINC	122	10.6 J	43 J	35.5 J	28 J	518	895
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.09 U	0.09 UJ	0.1 R	0.1 R	0.1 R	0.11 U	0.14 J

APPENDIX TABLE A-8-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016
LOCATION	16S006	16SO27	16SO27	16SO27	16SO36	16SO37
NSAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SUBMATRIX	SS	SO	SO	SO	SO	SO
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---
STATUS	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED
SAMPLE DATE	1/9/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)						
1,1,1-TRICHLOROETHANE	12 U					
1,1,2,2-TETRACHLOROETHANE	12 U					
1,1,2-TRICHLOROETHANE	12 U					
1,1-DICHLOROETHANE	12 U					
1,1-DICHLOROETHENE	12 U					
1,2-DICHLOROETHANE	12 UJ					
1,2-DICHLOROPROPANE	12 U					
2-BUTANONE	12 UJ					
2-HEXANONE	12 U					
4-METHYL-2-PENTANONE	12 U					
ACETONE	12 UJ					
BENZENE	12 U					
BROMODICHLOROMETHANE	12 U					
BROMOFORM	12 U					
BROMOMETHANE	12 U					
CARBON DISULFIDE	12 U					
CARBON TETRACHLORIDE	12 U					
CHLOROBENZENE	12 U					
CHLORODIBROMOMETHANE	12 U					
CHLOROETHANE	12 UJ					
CHLOROFORM	12 U					
CHLOROMETHANE	12 U					
CIS-1,3-DICHLOROPROPENE	12 U					
ETHYLBENZENE	12 U					
METHYLENE CHLORIDE	12 U					
STYRENE	12 U					
TETRACHLOROETHENE	12 U					
TOLUENE	12 U					
TOTAL 1,2-DICHLOROETHENE	12 U					
TOTAL XYLENES	12 U					
TRANS-1,3-DICHLOROPROPENE	12 U					
TRICHLOROETHENE	12 U					
VINYL CHLORIDE	12 U					
Semivolatile Organics (ug/kg)						
1,2,4-TRICHLOROBENZENE	420 U					
1,2-DICHLOROBENZENE	420 U					
1,3-DICHLOROBENZENE	420 U					
1,4-DICHLOROBENZENE	420 U					
1-METHYLNAPHTHALENE		14 J	14 J	24 U	24 U	25 U

APPENDIX TABLE A-8-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016
LOCATION	16S006	16SO27	16SO27	16SO27	16SO36	16SO37
NSAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SUBMATRIX	SS	SO	SO	SO	SO	SO
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---
STATUS	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED
SAMPLE DATE	1/9/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1100 U					
2,4,6-TRICHLOROPHENOL	420 U					
2,4-DICHLOROPHENOL	420 U					
2,4-DIMETHYLPHENOL	420 U					
2,4-DINITROPHENOL	1100 U					
2,4-DINITROTOLUENE	420 U					
2,6-DINITROTOLUENE	420 U					
2-CHLORONAPHTHALENE	420 U					
2-CHLOROPHENOL	420 U					
2-METHYLNAPHTHALENE	420 U	154	83	24 U	24 U	25 U
2-METHYLPHENOL	420 U					
2-NITROANILINE	1100 U					
2-NITROPHENOL	420 U					
3,3'-DICHLOROBENZIDINE	420 U					
3-NITROANILINE	1100 U					
4,6-DINITRO-2-METHYLPHENOL	1100 U					
4-BROMOPHENYL PHENYL ETHER	420 U					
4-CHLORO-3-METHYLPHENOL	420 U					
4-CHLOROANILINE	420 U					
4-METHYLPHENOL	420 U					
4-NITROANILINE	1100 U					
4-NITROPHENOL	1100 U					
ACENAPHTHENE	420 U	532	269	12 U	12 U	12 U
ACENAPHTHYLENE	420 U	11 U	11.5 U	12 U	12 U	12 U
ANTHRACENE	95 J	60	42.5	25	107	31
BENZO(A)ANTHRACENE	2300	156	180	204	599	172
BENZO(A)PYRENE	3100	275	323.5	372	991	304
BENZO(B)FLUORANTHENE	3600	291	336	381	1030	336
BENZO(G,H,I)PERYLENE	1200	291	311	331	880	244
BENZO(K)FLUORANTHENE	3200	143	163.5	184	476	165
BIS(2-CHLOROETHOXY)METHANE	420 U					
BIS(2-CHLOROETHYL)ETHER	420 U					
BIS(2-ETHYLHEXYL)PHTHALATE	420 U					
BUTYL BENZYL PHTHALATE	420 U					
CHRYSENE	3200	227	223	219	638	215
DI-N-BUTYL PHTHALATE	420 U					
DI-N-OCTYL PHTHALATE	420 U					
DIBENZO(A,H)ANTHRACENE	700	9.8 J	17.4 J	25	88	51
DIBENZOFURAN	420 U					
DIETHYL PHTHALATE	420 U					

APPENDIX TABLE A-8-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE LOCATION NSAMPLE SAMPLE SUBMATRIX SACODE DEPTH RANGE STATUS SAMPLE DATE COLLECTION METHOD	0016 16S006 16S00601 16S00601 SS NORMAL --- EXCAVATED 1/9/1996 GRAB	0016 16SO27 16SO2701 16SO2701 SO ORIG --- EXCAVATED 8/7/2001 GRAB	0016 16SO27 16SO2701-AVG 16SO2701-AVG SO AVG --- EXCAVATED 8/7/2001 GRAB	0016 16SO27 16SO2701-D 16SO2701-D SO DUP --- EXCAVATED 8/7/2001 GRAB	0016 16SO36 16SO3601 16SO3601 SO NORMAL --- EXCAVATED 8/7/2001 GRAB	0016 16SO37 16SO3701 16SO3701 SO NORMAL --- EXCAVATED 8/7/2001 GRAB
DIMETHYL PHTHALATE	420 U					
FLUORANTHENE	2300	236	224.5	213	556	213
FLUORENE	420 U	11 U	11.5 U	12 U	12 U	12 U
HEXACHLOROBENZENE	420 U					
HEXACHLOROBUTADIENE	420 U					
HEXACHLOROCYCLOPENTADIENE	420 UJ					
HEXACHLOROETHANE	420 U					
INDENO(1,2,3-CD)PYRENE	1900	343	316	289	780	276
ISOPHORONE	420 U					
N-NITROSO-DI-N-PROPYLAMINE	420 UJ					
N-NITROSODIPHENYLAMINE	420 U					
NAPHTHALENE	420 U	11 U	11.5 U	12 U	12 U	12 U
NITROBENZENE	420 U					
PENTACHLOROPHENOL	1100 U					
PHENANTHRENE	440	59	47.5	36	66	31
PHENOL	420 U					
PYRENE	1700	128	154.5	181	390	152
Pesticides PCBs (ug/kg)						
4,4'-DDD	21 U					
4,4'-DDE	100					
4,4'-DDT	89					
ALDRIN	11 U					
ALPHA-BHC	11 U					
ALPHA-CHLORDANE	11 U					
AROCLOR-1016	210 U					
AROCLOR-1221	420 U					
AROCLOR-1232	210 U					
AROCLOR-1242	210 U					
AROCLOR-1248	210 U					
AROCLOR-1254	210 U					
AROCLOR-1260	210 U					
BETA-BHC	11 U					
DELTA-BHC	11 U					
DIELDRIN	130					
ENDOSULFAN I	11 U					
ENDOSULFAN II	21 U					
ENDOSULFAN SULFATE	21 UJ					
ENDRIN	21 U					
ENDRIN KETONE	21 U					
GAMMA-BHC (LINDANE)	11 U					

APPENDIX TABLE A-8-3
SUMMARY OF ANALYTIC RESULTS - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016
LOCATION	16S006	16SO27	16SO27	16SO27	16SO36	16SO37
NSAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SUBMATRIX	SS	SO	SO	SO	SO	SO
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---
STATUS	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED
SAMPLE DATE	1/9/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
GAMMA-CHLORDANE	11 U					
HEPTACHLOR	11 U					
HEPTACHLOR EPOXIDE	11 U					
METHOXYCHLOR	110 U					
TOXAPHENE	1100 U					
Inorganics (mg/kg)						
ALUMINUM	7890 J					
ANTIMONY	12 UJ					
ARSENIC	2.2 J					
BARIUM	53.6					
BERYLLIUM	0.08 J					
CADMIUM	2.2					
CALCIUM	796 J					
CHROMIUM	11.5					
COBALT	1.5 J					
COPPER	71.7					
IRON	10300 J					
LEAD	236 J					
MAGNESIUM	154 J					
MANGANESE	132					
MERCURY	0.09					
NICKEL	4 J					
POTASSIUM	1000 UJ					
SELENIUM	1 U					
SILVER	1.2 J					
SODIUM	137 J					
THALLIUM	2 U					
VANADIUM	14.9					
ZINC	155					
Miscellaneous Parameters (mg/kg)						
CYANIDE	0.2 J					

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
TOLUENE	6 U	6 U	6 U	12 U	12 U	12 U	11 U	13 U	11 U	1 J	12 U
TOTAL XYLENES	5 J	2 J	1 J	12 U	12 U	12 U	11 U	13 U	11 U	11 U	12 U
Semivolatile Organics (ug/kg)											
1-METHYLNAPHTHALENE											
ACENAPHTHYLENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
BENZO(A)ANTHRACENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	250 J
BENZO(A)PYRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	310 J
BENZO(B)FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	350 J
BENZO(G,H,I)PERYLENE	370 U	380 U	410 U	390 UJ	385 UJ	380 U	370 UJ	420 U	370 UJ	360 UJ	120 J
BENZO(K)FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	340 J
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	380 U	43 J	390 U	385 U	380 U	370 U	420 U	370 U	360 U	110 J
CHRYSENE	370 UJ	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	270 J
DIBENZO(A,H)ANTHRACENE	370 U	380 U	410 U	390 U	385 U	380 U	370 UJ	420 U	370 U	360 U	110 J
FLUORANTHENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	260 J
INDENO(1,2,3-CD)PYRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	240 J
NAPHTHALENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	400 U
PHENANTHRENE	370 U	380 U	410 U	390 U	385 U	380 U	370 U	420 U	370 U	360 U	52 J
PYRENE	370 UJ	380 UJ	410 UJ	390 U	385 U	380 U	370 U	420 U	370 U	360 U	170 J
Pesticides PCBs (ug/kg)											
4,4'-DDD	18 U	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	4.2 UJ	3.7 U	3.6 U	18 J
4,4'-DDE	18 U	5.5 J	5.5 J	3.2 J	2.6 J	2 J	3.7 U	4.2 UJ	3.7 U	3.6 U	53
4,4'-DDT	18 U	9.1 J	5.2 J	3.8 J	3.25 J	2.7 J	3.7 U	4.2 UJ	3.7 U	3.6 U	22
ALPHA-CHLORDANE	89 U	92 U	99 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
AROCLOR-1254	180 U	180 U	200 U	39 U	38.5 UJ	38 UJ	37 U	36 J	37 U	36 U	200 U
AROCLOR-1260	180 U	180 U	200 U	39 U	38.5 UJ	38 UJ	37 U	42 UJ	37 U	36 U	200 U
DIELDRIN	33	18 U	20 U	3.9 U	3.85 UJ	3.8 UJ	3.7 U	2.5 J	3.7 U	3.6 U	20 U
GAMMA-CHLORDANE	89 U	92 U	99 U	2 U	2 UJ	2 UJ	1.9 U	2.2 UJ	1.9 U	1.8 U	10 U
TOTAL DDT	0 U	14.6 J	10.7 J	7 J	5.85 J	4.7 J	0 U	0 U	0 U	0 U	93 J
TOTAL DDT HALFND	27	23.6 J	20.7 J	8.95 J	7.775 J	6.6 J	5.55	6.3	5.55	5.4	93 J
TOTAL PCBs	0 U	0 U	0 U	0 U	0 U	0 U	0 U	36 J	0 U	0 U	0 U
TOTAL PCBs HALFND	402.5	410	447.5	156.5	154.75	153	148	184 J	148	144.5	810
Inorganics (mg/kg)											
ALUMINUM	10900	18600	14200	4250 J	5045 J	5840 J	6570 J	10600 J	11100 J	5610 J	8820 J
ANTIMONY	2.8 U	2.7 U	3 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	5.9 J
ARSENIC	1.9 J	1.4 J	3.1	0.94 J	1.07 J	1.2 J	1.6 J	2.5 J	1.5 J	1.3 J	5.6
BARIUM	19.4 J	14.7 J	42.9 J	13.2 J	13.4 J	13.6 J	11.2 J	42.8 J	13.1 J	6.1 J	257
BERYLLIUM	0.12 J	0.12 J	0.12 J	0.09 J	0.09 J	1 U	1 U	0.11 J	0.09 J	0.06 J	1 U
CADMIUM	0.63 U	0.61 U	1.6	0.28 J	0.29 J	0.3 J	0.36 J	0.43 J	0.25 J	1 U	7.6
CALCIUM	427 J	345 J	1180 J	210 J	191.5 J	173 J	260 J	907 J	80.8 J	70.8 J	2350

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16-SL-01	16-SL-02	16-SL-03	16S001	16S001	16S001	16S002	16S003	16S004	16S005	16S007
NSAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101-D	16S00201	16S00301	16S00401	16S00501	16S00701
SAMPLE	16-SL-01	16-SL-02	16-SL-03	16S00101	16S00101-AVG	16S00101D	16S00201	16S00301	16S00401	16S00501	16S00701
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/11/1992	8/11/1992	8/11/1992	1/8/1996	1/8/1996	1/8/1996	1/9/1996	1/9/1996	1/8/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHROMIUM	10.5	14.7	14.9	4	4.9	5.8	4.5	11.2	10.3	4	29.2
COBALT	1.3 J	0.95 J	1.7 J	10 U	10 U	10 U	10 U	1.4 J	10 U	0.69 J	4.1 J
COPPER	9.7	8.3	50.8	4.8 J	4.8 J	5 UJ	3.8 J	13.2	4.4 J	5 UJ	202
IRON	6300	8150	13600	2340 J	2625 J	2910 J	4090 J	5450 J	5160 J	3220 J	30300
LEAD	76	6.7 J	121	7.8 J	7.65 J	7.5 J	6.5 J	74.3 J	4.4 J	5.2 J	759
MAGNESIUM	106 J	134 J	228 J	103 J	126.5 J	150 J	91.3 J	264 J	127 J	82.7 J	443 J
MANGANESE	80.3	19.2	228	185	168	151	97.2	123	95.8	112	275
MERCURY	0.08 U	0.08 U	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.65 J
NICKEL	2.4 U	2.4 U	5.5 J	8 U	1.9 J	1.9 J	8 U	2.7 J	2.3 J	8 U	17.7
POTASSIUM	137 U	133 U	230 J	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 UJ	1000 U	180 J
SELENIUM	0.42 U	0.41 U	0.46 U	0.19 J	0.19 J	1 U	1 U	1 U	0.15 J	0.15 J	1 U
SILVER	0.34 U	0.33 U	0.87 J	2 U	2 U	2 U	2 U	2 U	2 U	2 U	7.1
SODIUM	196 J	189 J	232 J	129 J	129 J	1000 UJ	120 J	157 J	1000 UJ	1000 UJ	361 J
THALLIUM	0.47 U	0.46 U	0.5 U	2 U	2 U	2 U	2 U	0.18 J	0.13 J	2 U	2 U
VANADIUM	23.2	28.9	22.7	6.8 J	7.7 J	8.6 J	10.2 J	19.4	17.5	7.3 J	14.4
ZINC	22.7	12.5	128	6.4	6.65	6.9	8	59.2	6.3	4.8	773
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.25 U	0.24 U	0.27 U	0.12 J	0.12 J	0.12 J	0.5 U	0.13 J	0.5 U	0.14 J	0.5 UJ

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
TOLUENE	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
TOTAL XYLENES	12 U	11 U	11 U	11 U	11 U	12 U	13 U	11 U	11 U	11 U	12 U
Semivolatile Organics (ug/kg)											
1-METHYLNAPHTHALENE											
ACENAPHTHYLENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
BENZO(A)ANTHRACENE	400 UJ	67 J	350 U	350 U	350 U	56 J	420 U	370 U	370 U	360 U	400 U
BENZO(A)PYRENE	400 UJ	130 J	350 U	350 U	350 U	71 J	120 J	370 U	370 U	360 U	400 U
BENZO(B)FLUORANTHENE	400 UJ	300 J	350 U	350 U	350 U	86 J	420 U	370 U	370 U	360 U	400 U
BENZO(G,H,I)PERYLENE	400 UJ	380 UJ	350 U	350 U	350 U	380 U	490	370 U	370 U	360 U	400 U
BENZO(K)FLUORANTHENE	400 UJ	380 U	350 U	350 UJ	350 UJ	73 J	420 U	370 U	370 U	360 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	50 J	380 U	350 U	58 J	58 J	78 J	420 U	370 U	370 U	360 U	45 J
CHRYSENE	400 UJ	120 J	350 U	350 U	350 U	62 J	54 J	370 U	370 U	360 U	400 U
DIBENZO(A,H)ANTHRACENE	400 UJ	380 UJ	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
FLUORANTHENE	400 UJ	86	350 U	350 U	350 U	59 J	420 U	370 U	370 U	360 U	400 U
INDENO(1,2,3-CD)PYRENE	400 UJ	90 J	350 U	350 U	350 U	380 U	62 J	370 U	370 U	360 U	400 U
NAPHTHALENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
PHENANTHRENE	400 UJ	380 U	350 U	350 U	350 U	380 U	420 U	370 U	370 U	360 U	400 U
PYRENE	400 UJ	150	350 U	350 U	350 U	44 J	420 U	370 U	370 U	360 U	400 U
Pesticides PCBs (ug/kg)											
4,4'-DDD	4 U	7.2 U	3.5 UJ	5.25 UJ	7 U	2.1 J	4.2 UJ	3.7 UJ	3.7 U	3.6 U	4 U
4,4'-DDE	4 U	11	13 J	17.5 J	22	51	26 J	3.7 UJ	3.7 U	3.6 U	4 U
4,4'-DDT	4 U	16	6.4 J	7.7 J	9	28	7.1 J	3.7 UJ	3.7 U	3.6 U	4 U
ALPHA-CHLORDANE	2.1 U	2.6 J	6.8 J	9.4 J	12 J	2 U	2.2 UJ	1.6 J	1.9 U	1.8 U	2 U
AROCLOR-1254	130	72 U	35 UJ	52.5 UJ	70 U	38 U	42 UJ	37 UJ	37 U	36 U	40 U
AROCLOR-1260	40 U	72 U	48 J	79 J	110 J	38 U	42 UJ	37 UJ	37 U	36 U	40 U
DIELDRIN	9.2	17	33 J	46.5 J	60	3.8 U	2.9 J	7.2 J	3.7 U	3.6 U	4 U
GAMMA-CHLORDANE	2.1 U	2.2 J	4 J	5.95 J	7.9 J	2 U	2.2 UJ	1 J	1.9 U	1.8 U	2 U
TOTAL DDT	0 U	27	19.4 J	25.2 J	31	81.1 J	33.1 J	0 U	0 U	0 U	0 U
TOTAL DDT HALFND	6	30.6	21.15 J	27.825 J	34.5	81.1 J	35.2 J	5.55	5.55	5.4	6
TOTAL PCBs	130	0 U	48 J	79 J	110 J	0 U	0 U	0 U	0 U	0 U	0 U
TOTAL PCBs HALFND	271	291	171 J	263 J	345 J	153	168.5	148	148	144.5	160.5
Inorganics (mg/kg)											
ALUMINUM	9300 J	8050 J	2000 J	1890 J	1780 J	8210 J	13900 J	9130 J	8050 J	5010 J	7280 J
ANTIMONY	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	3.4	2.8	0.76 J	0.7 J	0.64 J	12.1	6.6	1.6 J	1.5 J	1.4 J	2.2 J
BARIUM	13.3 J	55.7	4.9 J	4.45 J	4 J	92.5	39.5 J	12.3 J	19.7 J	7.8 J	10.7 J
BERYLLIUM	0.11 J	0.11 J	1 U	1 U	1 U	0.06 J	0.23 J	0.1 J	0.09 J	0.06 J	1 U
CADMIUM	0.36 J	0.67 J	1 U	0.23 J	0.23 J	5.3	2.1	0.21 J	0.21 J	0.23 J	0.38 J
CALCIUM	302 J	1080 J	101 J	100.4 J	99.8 J	1230	658 J	441 J	670 J	96.5 J	327 J

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S008	16S009	16S010	16S010	16S010	16S011	16S012	16S013	16S014	16S015	16S016
NSAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001-D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SAMPLE	16S00801	16S00901	16S01001	16S01001-AVG	16S01001D	16S01101	16S01201	16S01301	16S01401	16S01501	16S01601
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	1/8/1996	1/9/1996	1/9/1996	1/9/1996	1/10/1996	1/9/1996	1/9/1996	1/10/1996	1/8/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHROMIUM	11	11.3	3.9	3.6	3.3	24.5	19.3	8	5.4	3.2	5.5
COBALT	10 U	10 U	10 U	10 U	10 U	3.9 J	1.2 J	0.7 J	0.85 J	10 U	10 U
COPPER	5.2 J	20	10.2	9.4	8.6	139	80.1	5.6	6.1	2.9 J	5.4 J
IRON	6380 J	5370 J	1470 J	1390 J	1310 J	48900	13500 J	4760 J	4030	2920 J	5290
LEAD	19.8 J	173 J	13.5 J	12.95 J	12.4 J	436	128 J	60 J	22.9	4.4 J	15.8
MAGNESIUM	54.6 J	298 J	38.5 J	34.2 J	29.9 J	255 J	168 J	142 J	186 J	84.2 J	95.8 J
MANGANESE	21.5	120	5.6	5.25	4.9	270	88.1	54.7	372	253	32.3
MERCURY	0.1 U	0.1 U	0.2	0.185	0.17	0.18 J	0.11	0.1 U	0.05 J	0.1 U	0.06 J
NICKEL	8 U	5.1 J	8 U	8 U	8 U	26	5.9 J	8 U	4.1 J	8 U	8 U
POTASSIUM	1000 UJ	1000 UJ	1000 U	77.6 J	77.6 J	107 J	1000 UJ	1000 UJ	69.7 J	1000 U	76.9 J
SELENIUM	1 U	1 U	0.13 J	0.13 J	1 U	1 U	0.19 J	1 U	0.15 J	0.2 J	1 U
SILVER	2 U	2 U	4.1	3.85	3.6	2.2 J	1.3 J	2 U	2 U	2 U	2 U
SODIUM	149 J	124 J	139 J	128.5 J	118 J	189 J	145 J	117 J	181 J	114 J	186 J
THALLIUM	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
VANADIUM	28.2	21.8	3.4 J	3.3 J	3.2 J	16.7	26.5	14	11.2	7 J	13.3
ZINC	13.1	161	4.1 J	3.75 J	3.4 J	488	177	16.3	8	4.7	16.7
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.5 U	0.18 J	0.1 J	0.135 J	0.17 J	0.5 UJ	0.16 J	0.5 U	0.5 U	0.51 J	0.5 UJ

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)									
TOLUENE	11 U								
TOTAL XYLENES	11 U								
Semivolatile Organics (ug/kg)									
1-METHYLNAPHTHALENE		41	10 U	11 U	22 U	11 U	11 U	24 U	23 U
ACENAPHTHYLENE	360 U	7.6 U	7	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
BENZO(A)ANTHRACENE	360 U	36	24	185	7.8 J	18	14	3.2 J	3.3 J
BENZO(A)PYRENE	360 U	57	47	217	19	7.1 U	7.3 U	12 U	5.3 J
BENZO(B)FLUORANTHENE	360 U	60	57	226	14	8.4	7 J	12 U	12 U
BENZO(G,H,I)PERYLENE	360 U	50	74	214	17	7.1 U	14	4.7 J	6 J
BENZO(K)FLUORANTHENE	360 U	20	26	102	7.7 J	7.1 U	7.3 U	12 U	12 U
BIS(2-ETHYLHEXYL)PHTHALATE	48 J								
CHRYSENE	360 U	42	25	159	7.2 J	9.3	6.3 J	12 U	4.4 J
DIBENZO(A,H)ANTHRACENE	360 U	7.6 U	7 U	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
FLUORANTHENE	360 U	39	18	169	11	12	11	12 U	12 U
INDENO(1,2,3-CD)PYRENE	360 U	48	38	199	15	11	8.1	4.5 J	5.8 J
NAPHTHALENE	360 U	7.6 U	27	7.1 U	11 U	7.1 U	7.3 U	12 U	12 U
PHENANTHRENE	360 U	14	7 U	34	20	4.9 J	7.3 U	4.6 J	12 U
PYRENE	360 U	20	5.9 J	93	15	5.3 J	24	12 U	12 U
Pesticides PCBs (ug/kg)									
4,4'-DDD	3.6 U								
4,4'-DDE	3.6 U								
4,4'-DDT	3.6 U								
ALPHA-CHLORDANE	1.9 U								
AROCLOR-1254	36 U								
AROCLOR-1260	36 U								
DIELDRIN	3.6 U								
GAMMA-CHLORDANE	1.9 U								
TOTAL DDT	0 U								
TOTAL DDT HALFND	5.4								
TOTAL PCBs	0 U								
TOTAL PCBs HALFND	145								
Inorganics (mg/kg)									
ALUMINUM	4320 J								
ANTIMONY	12 UJ								
ARSENIC	1.3 J								
BARIUM	6.7 J								
BERYLLIUM	1 U								
CADMIUM	0.26 J								
CALCIUM	158 J								

APPENDIX TABLE A-8-4
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016	0016	0016
LOCATION	16S017	16SO24	16SO25	16SO26	16SO28	16SO32	16SO33	16SO34	16SO35
NSAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SAMPLE	16S01701	16SO2401	16SO2501	16SO2601	16SO2801	16SO3201	16SO3301	16SO3401	16SO3501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/10/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
CHROMIUM	3.5								
COBALT	10 U								
COPPER	5.8								
IRON	3070								
LEAD	29.6								
MAGNESIUM	56.6 J								
MANGANESE	34.3								
MERCURY	0.06 J								
NICKEL	2.5 J								
POTASSIUM	1000 U								
SELENIUM	1 U								
SILVER	2 U								
SODIUM	170 J								
THALLIUM	2 U								
VANADIUM	7.3 J								
ZINC	14.7								
Miscellaneous Parameters (mg/kg)									
CYANIDE	0.5 UJ								

APPENDIX TABLE A-8-5
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
2-BUTANONE	11 U	11 U	12 UJ	12 UJ	12 UJ	19	11 U
ACETONE	130 UJ	11 UJ	150 UJ	145 UJ	140 UJ	87 J	11 UJ
CARBON DISULFIDE	26	5 J	13	11 J	9 J	1 J	5 J
ETHYLBENZENE	11 U	11 U	2 J	2 J	12 U	12 U	11 U
METHYLENE CHLORIDE	120 UJ	31 UJ	150 J	86.5 J	46 UJ	19 UJ	33 UJ
TOLUENE	1 J	11 U	12 U	12 U	12 U	12 U	11 U
TOTAL XYLENES	11 J	3 J	7 J	6 J	5 J	2 J	4 J
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	39 J	370 U	400 U	415 U	430 U	410 U	380 U
ACENAPHTHENE	370 U	370 U	400 U	415 U	430 U	77 J	380 U
BENZO(A)PYRENE	370 U	370 U	400 U	415 U	430 U	44 J	380 U
BENZO(B)FLUORANTHENE	370 U	370 U	400 U	415 U	430 U	77 J	380 U
BENZO(K)FLUORANTHENE	370 UJ	370 U	400 U	415 U	430 U	48 J	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	370 U	400 UJ	415 UJ	430 UJ	150 J	39 J
FLUORANTHENE	120 J	370 U	400 U	415 U	430 U	270 J	380 U
FLUORENE	370 U	370 U	400 U	415 U	430 U	110 J	380 U
NAPHTHALENE	39 J	370 U	400 U	415 U	430 U	410 U	380 U
PHENANTHRENE	58 J	370 U	400 U	415 U	430 U	340 J	380 U
PYRENE	77 J	370 U	400 U	415 U	430 U	190 J	380 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	2.2 J	3.7 UJ	4 U	4.15 U	4.3 U	36 J	4.9 J
4,4'-DDE	1.8 J	3.7 UJ	4 U	4.15 U	4.3 U	30 J	83
4,4'-DDT	3.7 U	3.7 UJ	4 U	4.15 U	4.3 U	5.7 J	52
DIELDRIN	1.6 J	3.7 UJ	4 U	4.15 U	4.3 U	4.1 UJ	7.6 U
Inorganics (mg/kg)							
ALUMINUM	17000	15400	29000	24250	19500	11000	17300
ANTIMONY	2.5 J	2.4 U	2.6 UJ	2.6 UJ	2.6 UJ	6.7 J	5.9 J
ARSENIC	2.7	1.5 J	5.1 J	5.45 J	5.8 J	15.1	11
BARIUM	36 J	35 J	21 J	20 J	19 J	175	122
BERYLLIUM	0.18 J	0.21 J	0.23 J	0.26 J	0.29 J	0.19 J	0.19 J
CADMIUM	2.4 J	0.67 U	0.74 U	0.735 U	0.73 U	9	8.7
CALCIUM	877 J	254 J	478 UJ	510 UJ	542 UJ	5870	1370
CHROMIUM	16.6	10.5	32.5 J	29.9 J	27.3 J	24.7	36.9
COBALT	1.1 J	1.2 J	2.4 J	1.9 J	1.4 J	4.5 J	9.6 J
COPPER	16.2	4.8 J	13.7	10.8	7.9	143	3620
IRON	8440	6670	21700	19650	17600	37500	74800
LEAD	74.6	6.8	17.3 J	15.95 J	14.6 J	766	567
MAGNESIUM	243 J	293 J	211 J	198 J	185 J	586 J	400 J
MANGANESE	93.1	231	54	46.95	39.9	297	638

APPENDIX TABLE A-8-5
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016	0016
LOCATION	TP-16-02	TP-16-03	TP-16-04	TP-16-04	TP-16-04	TP-16-06	TP-16-10
NSAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403-D	16SS0604	16SS1005
SAMPLE	16SS0201	16SS0302	16SS0403	16SS0403-AVG	16SS0403A	16-SS-06-04	16-SS-10-05
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	2 - 3.5	6 - 8	9 - 10	9 - 10	9 - 10	10.5 - 10.5	2 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	10/4/1992	10/4/1992	9/11/1992	9/11/1992	9/11/1992	10/5/1992	10/6/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
MERCURY	0.29 J	0.43 J	0.14 UJ	0.12 UJ	0.1 UJ	0.25 J	0.17 J
NICKEL	4.4 J	4.4 J	4.4 J	3.35 J	2.3 J	24.3	35.9
POTASSIUM	258 J	153 U	270 J	313 J	356 J	412 J	166 J
SILVER	0.79 J	0.46 U	0.64 UJ	0.67 UJ	0.7 UJ	4.3	3.4
SODIUM	243 J	207 J	223 UJ	224 UJ	225 UJ	514 J	332 J
VANADIUM	25	19.1	63.3	65.4	67.5	19	27.9
ZINC	122	10.6 J	43 J	35.5 J	28 J	518	895
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.09 U	0.09 UJ	0.1 R	0.1 R	0.1 R	0.11 U	0.14 J

APPENDIX TABLE A-8-6
SUMMARY OF CHEMICALS DETECTED - EXCAVATED SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0016	0016	0016	0016	0016	0016
LOCATION	16S006	16SO27	16SO27	16SO27	16SO36	16SO37
NSAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SAMPLE	16S00601	16SO2701	16SO2701-AVG	16SO2701-D	16SO3601	16SO3701
SUBMATRIX	SS	SO	SO	SO	SO	SO
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---
STATUS	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED	EXCAVATED
SAMPLE DATE	1/9/1996	8/7/2001	8/7/2001	8/7/2001	8/7/2001	8/7/2001
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Semivolatile Organics (ug/kg)						
1-METHYLNAPHTHALENE		14 J	14 J	24 U	24 U	25 U
2-METHYLNAPHTHALENE	420 U	154	83	24 U	24 U	25 U
ACENAPHTHENE	420 U	532	269	12 U	12 U	12 U
ANTHRACENE	95 J	60	42.5	25	107	31
BENZO(A)ANTHRACENE	2300	156	180	204	599	172
BENZO(A)PYRENE	3100	275	323.5	372	991	304
BENZO(B)FLUORANTHENE	3600	291	336	381	1030	336
BENZO(G,H,I)PERYLENE	1200	291	311	331	880	244
BENZO(K)FLUORANTHENE	3200	143	163.5	184	476	165
CHRYSENE	3200	227	223	219	638	215
DIBENZO(A,H)ANTHRACENE	700	9.8 J	17.4 J	25	88	51
FLUORANTHENE	2300	236	224.5	213	556	213
INDENO(1,2,3-CD)PYRENE	1900	343	316	289	780	276
PHENANTHRENE	440	59	47.5	36	66	31
PYRENE	1700	128	154.5	181	390	152
Pesticides PCBs (ug/kg)						
4,4'-DDE	100					
4,4'-DDT	89					
DIELDRIN	130					
Inorganics (mg/kg)						
ALUMINUM	7890 J					
ARSENIC	2.2 J					
BARIUM	53.6					
BERYLLIUM	0.08 J					
CADMIUM	2.2					
CALCIUM	796 J					
CHROMIUM	11.5					
COBALT	1.5 J					
COPPER	71.7					
IRON	10300 J					
LEAD	236 J					
MAGNESIUM	154 J					
MANGANESE	132					
MERCURY	0.09					
NICKEL	4 J					
SILVER	1.2 J					
SODIUM	137 J					
VANADIUM	14.9					
ZINC	155					
Miscellaneous Parameters (mg/kg)						
CYANIDE	0.2 J					

APPENDIX TABLE A-8-7
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
TOLUENE	1/19	1 J	1 J	6 - 13	5.11	1.00	16S00501
TOTAL XYLENES	3/19	1 J	5 J	11 - 13	5.29	2.67	16-SL-01
Semivolatile Organics (ug/kg)							
1-METHYLNAPHTHALENE	1/8	41	41	10 - 24	12.1	41.0	16SO2401
ACENAPHTHYLENE	1/27	7	7	7.1 - 420	136	7.00	16SO2501
BENZO(A)ANTHRACENE	11/27	3.2 J	250 J	350 - 420	137	60.4	16S00701
BENZO(A)PYRENE	9/27	5.3 J	310 J	7.1 - 420	142	108	16S00701
BENZO(B)FLUORANTHENE	9/27	7 J	350 J	12 - 420	154	123	16S00701
BENZO(G,H,I)PERYLENE	9/27	4.7 J	490	7.1 - 420	156	110	16S01201
BENZO(K)FLUORANTHENE	6/27	7.7 J	340 J	7.1 - 420	142	94.8	16S00701
BIS(2-ETHYLHEXYL)PHTHALATE	7/19	43 J	110 J	350 - 420	143	61.7	16S00701
CHRYSENE	11/27	4.4 J	270 J	12 - 420	133	69.0	16S00701
DIBENZO(A,H)ANTHRACENE	1/27	110 J	110 J	7 - 420	132	110	16S00701
FLUORANTHENE	9/27	11	260 J	12 - 420	138	73.9	16S00701
INDENO(1,2,3-CD)PYRENE	11/27	4.5 J	240 J	350 - 420	139	65.6	16S00701
NAPHTHALENE	1/27	27	27	7.1 - 420	137	27.0	16SO2501
PHENANTHRENE	6/27	4.6 J	52 J	7 - 420	132	21.6	16S00701
PYRENE	9/27	5.3 J	170 J	12 - 420	133	58.6	16S00701
Pesticides PCBs (ug/kg)							
4,4'-DDD	2/19	2.1 J	18 J	3.5 - 20	4.07	10.1	16S00701
4,4'-DDE	8/19	2 J	53	3.6 - 18	10.5	21.5	16S00701
4,4'-DDT	8/19	2.7 J	28	3.6 - 18	6.64	12.3	16S01101
ALPHA-CHLORDANE	3/19	1.6 J	12 J	1.8 - 99	8.97	4.53	16S01001-D
AROCLOR-1254	2/19	36 J	130	35 - 200	42.9	83.0	16S00801
AROCLOR-1260	1/19	48 J	110 J	36 - 200	39.1	79.0	16S01001-D
DIELDRIN	7/19	2.5 J	60	3.6 - 20	8.64	16.9	16S01001-D
GAMMA-CHLORDANE	3/19	1 J	7.9 J	1.8 - 99	8.74	3.05	16S01001-D
Inorganics (mg/kg)							
ALUMINUM	19/19	1780 J	18600	---	8768	8768	16-SL-02
ANTIMONY	1/19	5.9 J	5.9 J	2.7 - 12	5.27	5.90	16S00701
ARSENIC	19/19	0.64 J	12.1	---	2.82	2.82	16S01101
BARIUM	19/19	4 J	257	---	36.0	36.0	16S00701
BERYLLIUM	14/19	0.06 J	0.23 J	1	0.209	0.105	16S01201
CADMIUM	16/19	0.21 J	7.6	0.61 - 1	1.14	1.28	16S00701
CALCIUM	19/19	70.8 J	2350	---	572	572	16S00701
CHROMIUM	19/19	3.2	29.2	---	10.5	10.5	16S00701
COBALT	10/19	0.69 J	4.1 J	10	3.25	1.68	16S00701
COPPER	18/19	2.9 J	202	5	30.5	32.0	16S00701
IRON	19/19	1310 J	48900	---	9184	9184	16S01101
LEAD	19/19	4.4 J	759	---	103	103	16S00701
MAGNESIUM	19/19	29.9 J	443 J	---	157	157	16S00701
MANGANESE	19/19	4.9	372	---	129	129	16S01401
MERCURY	8/19	0.05 J	0.65 J	0.08 - 0.1	0.101	0.174	16S00701
NICKEL	10/19	1.9 J	26	2.4 - 8	5.48	7.37	16S01101
POTASSIUM	6/19	69.7 J	230 J	133 - 1000	336	124	16-SL-03
SELENIUM	7/19	0.13 J	0.2 J	0.41 - 1	0.332	0.166	16S01501

APPENDIX TABLE A-8-7
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
SILVER	5/19	0.87 J	7.1	0.33 - 2	1.46	3.06	16S00701
SODIUM	17/19	114 J	361 J	1000	205	170	16S00701
THALLIUM	2/19	0.13 J	0.18 J	0.46 - 2	0.791	0.155	16S00301
VANADIUM	19/19	3.2 J	28.9	---	15.8	15.8	16-SL-02
ZINC	19/19	3.4 J	773	---	101	101	16S00701
Miscellaneous Parameter (mg/kg)							
CYANIDE	7/19	0.1 J	0.51 J	0.24 - 0.5	0.211	0.196	16S01501

APPENDIX TABLE A-8-8
SUMMARY OF DESCRIPTIVE STATISTICS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	1/5	19	19	11 - 12	8.30	19.0	16SS0604
ACETONE	1/5	87 J	87 J	11 - 150	47.1	87.0	16SS0604
CARBON DISULFIDE	5/5	1 J	26	---	9.60	9.60	16SS0201
ETHYLBENZENE	1/5	2 J	2 J	11 - 12	4.90	2.00	16SS0403
METHYLENE CHLORIDE	1/5	150 J	150 J	19 - 120	37.6	86.5	16SS0403
TOLUENE	1/5	1 J	1 J	11 - 12	4.80	1.00	16SS0201
TOTAL XYLENES	5/5	2 J	11 J	---	5.20	5.20	16SS0201
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	1/5	39 J	39 J	370 - 430	165	39.0	16SS0201
ACENAPHTHENE	1/5	77 J	77 J	370 - 430	169	77.0	16SS0604
BENZO(A)PYRENE	1/5	44 J	44 J	370 - 430	162	44.0	16SS0604
BENZO(B)FLUORANTHENE	1/5	77 J	77 J	370 - 430	169	77.0	16SS0604
BENZO(K)FLUORANTHENE	1/5	48 J	48 J	370 - 430	163	48.0	16SS0604
BIS(2-ETHYLHEXYL)PHTHALATE	2/5	39 J	150 J	370 - 430	153	94.5	16SS0604
FLUORANTHENE	2/5	120 J	270 J	370 - 430	195	195	16SS0604
FLUORENE	1/5	110 J	110 J	370 - 430	176	110	16SS0604
NAPHTHALENE	1/5	39 J	39 J	370 - 430	165	39.0	16SS0201
PHENANTHRENE	2/5	58 J	340 J	370 - 430	196	199	16SS0604
PYRENE	2/5	77 J	190 J	370 - 430	170	134	16SS0604
Pesticides PCBs (ug/kg)							
4,4'-DDD	3/5	2.2 J	36 J	3.7 - 4.3	9.41	14.4	16SS0604
4,4'-DDE	3/5	1.8 J	83	3.7 - 4.3	23.7	38.3	16SS1005
4,4'-DDT	2/5	5.7 J	52	3.7 - 4.3	12.7	28.9	16SS1005
DIELDRIN	1/5	1.6 J	1.6 J	3.7 - 7.6	2.28	1.60	16SS0201
Inorganics (mg/kg)							
ALUMINUM	5/5	11000	29000	---	16990	16990	16SS0403
ANTIMONY	3/5	2.5 J	6.7 J	2.4 - 2.6	3.52	5.03	16SS0604
ARSENIC	5/5	1.5 J	15.1	---	7.15	7.15	16SS0604
BARIUM	5/5	19 J	175	---	77.6	77.6	16SS0604
BERYLLIUM	5/5	0.18 J	0.29 J	---	0.206	0.206	16SS0403-D
CADMIUM	3/5	2.4 J	9	0.67 - 0.74	4.16	6.70	16SS0604
CALCIUM	4/5	254 J	5870	478 - 542	1725	2093	16SS0604
CHROMIUM	5/5	10.5	36.9	---	23.7	23.7	16SS1005
COBALT	5/5	1.1 J	9.6 J	---	3.66	3.66	16SS1005
COPPER	5/5	4.8 J	3620	---	759	759	16SS1005
IRON	5/5	6670	74800	---	29412	29412	16SS1005
LEAD	5/5	6.8	766	---	286	286	16SS0604
MAGNESIUM	5/5	185 J	586 J	---	344	344	16SS0604
MANGANESE	5/5	39.9	638	---	261	261	16SS1005
MERCURY	4/5	0.17 J	0.43 J	0.1 - 0.14	0.240	0.285	16SS0302
NICKEL	5/5	2.3 J	35.9	---	14.5	14.5	16SS1005
POTASSIUM	4/5	166 J	412 J	153	245	287	16SS0604
SILVER	3/5	0.79 J	4.3	0.46 - 0.7	1.81	2.83	16SS0604
SODIUM	4/5	207 J	514 J	223 - 225	282	324	16SS0604
VANADIUM	5/5	19	67.5	---	31.3	31.3	16SS0403-D
ZINC	5/5	10.6 J	895	---	316	316	16SS1005
Miscellaneous Parameter (mg/kg)							
CYANIDE	1/4	0.14 J	0.14 J	0.09 - 0.11	0.0713	0.140	16SS1005

APPENDIX TABLE A-8-9
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)													
TOLUENE	19	1	5%	1.00	1.00	5.11	1.00	1.48	-1.688	Shapiro-Wilk	Undefined	1.00	Maximum Detected Concentration
TOTAL XYLENES	19	3	16%	1.00	5.00	5.29	2.67	1.40	-2.482	Shapiro-Wilk	Undefined	5.00	Maximum Detected Concentration
Semivolatile Organics (ug/kg)													
1-METHYLNAPHTHALENE	8	1	13%	41.0	41.0	12.1	41.0	12.1	2.48	Shapiro-Wilk	Undefined	18.8	Non-Parametric UCL
ACENAPHTHYLENE	27	1	4%	7.00	7.00	136	7.00	87.0	-0.911	Shapiro-Wilk	Undefined	7.00	Maximum Detected Concentration
BENZO(A)ANTHRACENE	27	11	41%	3.20	250	137	60.4	82.9	-0.712	Shapiro-Wilk	Undefined	163	Non-Parametric UCL
BENZO(A)PYRENE	27	9	33%	5.30	310	142	108	83.5	-0.498	Shapiro-Wilk	Undefined	168	Non-Parametric UCL
BENZO(B)FLUORANTHENE	27	9	33%	7.00	350	154	123	91.4	-0.314	Shapiro-Wilk	Undefined	184	Non-Parametric UCL
BENZO(G,H,I)PERYLENE	27	9	33%	4.70	490	156	110	100	0.841	Shapiro-Wilk	Undefined	188	Non-Parametric UCL
BENZO(K)FLUORANTHENE	27	6	22%	7.70	340	142	94.8	89.7	-0.366	Shapiro-Wilk	Undefined	170	Non-Parametric UCL
BIS(2-ETHYLHEXYL)PHTHALATE	19	7	37%	43.0	110	143	61.7	65.5	-0.670	Shapiro-Wilk	Undefined	110	Maximum Detected Concentration
CHRYSENE	27	11	41%	4.40	270	133	69.0	83.1	-0.557	Shapiro-Wilk	Undefined	159	Non-Parametric UCL
DIBENZO(A,H)ANTHRACENE	27	1	4%	110	110	132	110	86.4	-0.831	Shapiro-Wilk	Undefined	110	Maximum Detected Concentration
FLUORANTHENE	27	9	33%	11.0	260	138	73.9	82.7	-0.700	Shapiro-Wilk	Undefined	163	Non-Parametric UCL
INDENO(1,2,3-CD)PYRENE	27	11	41%	4.50	240	139	65.6	80.2	-0.791	Shapiro-Wilk	Undefined	164	Non-Parametric UCL
NAPHTHALENE	27	1	4%	27.0	27.0	137	27.0	85.9	-0.917	Shapiro-Wilk	Undefined	27.0	Maximum Detected Concentration
PHENANTHRENE	27	6	22%	4.60	52.0	132	21.6	84.8	-0.753	Shapiro-Wilk	Undefined	52.0	Maximum Detected Concentration
PYRENE	27	9	33%	5.30	170	133	58.6	80.7	-0.781	Shapiro-Wilk	Undefined	158	Non-Parametric UCL
Pesticides PCBs (ug/kg)													
4,4'-DDD	19	2	11%	2.10	18.0	4.07	10.1	4.35	2.29	Shapiro-Wilk	Undefined	5.63	Non-Parametric UCL
4,4'-DDE	19	8	42%	2.60	53.0	10.5	21.5	16.0	2.13	Shapiro-Wilk	Undefined	16.6	Non-Parametric UCL
4,4'-DDT	19	8	42%	3.25	28.0	6.64	12.3	7.57	1.87	Shapiro-Wilk	Undefined	9.38	Non-Parametric UCL
ALPHA-CHLORDANE	19	3	16%	1.60	9.40	8.97	4.53	16.9	1.99	Shapiro-Wilk	Undefined	9.40	Maximum Detected Concentration
AROCLOR-1254	19	2	11%	36.0	130	42.9	83.0	37.5	1.27	Shapiro-Wilk	Undefined	56.8	Non-Parametric UCL
AROCLOR-1260	19	1	5%	79.0	79.0	39.1	79.0	32.8	1.18	Shapiro-Wilk	Undefined	51.0	Non-Parametric UCL
DIELDRIN	19	7	37%	2.50	46.5	8.64	16.9	12.0	2.38	Shapiro-Wilk	Undefined	12.8	Non-Parametric UCL
GAMMA-CHLORDANE	19	3	16%	1.00	5.95	8.74	3.05	17.0	2.02	Shapiro-Wilk	Undefined	5.95	Maximum Detected Concentration
Inorganics (mg/kg)													
ALUMINUM	19	19	100%	1890	18600	8768	8768	3942	0.720	Shapiro-Wilk	Normal/Lognormal	11464	H-UCL
ANTIMONY	19	1	5%	5.90	5.90	5.27	5.90	1.72	-2.041	Shapiro-Wilk	Undefined	5.90	Non-Parametric UCL
ARSENIC	19	19	100%	0.700	12.1	2.82	2.82	2.71	2.60	Shapiro-Wilk	Lognormal	3.92	H-UCL
BARIUM	19	19	100%	4.45	257	36.0	36.0	57.9	3.44	Shapiro-Wilk	Lognormal	67.1	95% Chebyshev(MVUE) UCL
BERYLLIUM	19	14	74%	0.060	0.230	0.209	0.105	0.182	1.05	Shapiro-Wilk	Undefined	0.230	Maximum Detected Concentration
CADMIUM	19	16	84%	0.210	7.60	1.14	1.28	1.97	2.70	Shapiro-Wilk	Undefined	1.86	Non-Parametric UCL
CALCIUM	19	19	100%	70.8	2350	572	572	574	1.85	Shapiro-Wilk	Lognormal	1257	95% Chebyshev(MVUE) UCL
CHROMIUM	19	19	100%	3.20	29.2	10.5	10.5	7.37	1.26	Shapiro-Wilk	Lognormal	15.2	H-UCL
COBALT	19	10	53%	0.690	4.10	3.25	1.68	1.92	-0.320	Shapiro-Wilk	Undefined	3.94	Non-Parametric UCL
COPPER	19	18	95%	2.90	202	30.5	32.0	54.0	2.46	Shapiro-Wilk	Undefined	51.1	Non-Parametric UCL
IRON	19	19	100%	1390	48900	9184	9184	11611	2.78	Shapiro-Wilk	Lognormal	13973	H-UCL
LEAD	19	19	100%	4.40	759	103	103	189	2.86	Shapiro-Wilk	Lognormal	514	99% Chebyshev(MVUE) UCL
MAGNESIUM	19	19	100%	34.2	443	157	157	102	1.36	Shapiro-Wilk	Lognormal	222	H-UCL
MANGANESE	19	19	100%	5.25	372	129	129	104	0.892	Shapiro-Wilk	Normal/Lognormal	329	95% Chebyshev(MVUE) UCL
MERCURY	19	8	42%	0.050	0.650	0.101	0.174	0.140	3.74	Shapiro-Wilk	Undefined	0.156	Non-Parametric UCL
NICKEL	19	10	53%	1.90	26.0	5.48	7.37	6.07	2.81	Shapiro-Wilk	Undefined	7.74	Non-Parametric UCL
POTASSIUM	19	6	32%	69.7	230	336	124	202	-0.452	Shapiro-Wilk	Undefined	230	Maximum Detected Concentration
SELENIUM	19	7	37%	0.130	0.200	0.332	0.166	0.166	0.050	Shapiro-Wilk	Undefined	0.200	Maximum Detected Concentration

APPENDIX TABLE A-8-9
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
SILVER	**19**	**5**	**26%**	**0.870**	**7.10**	**1.46**	**3.06**	**1.57**	**3.03**	**Shapiro-Wilk**	**Undefined**	2.04	Non-Parametric UCL
SODIUM	19	17	89%	114	361	205	170	118	1.92	Shapiro-Wilk	Undefined	248	Non-Parametric UCL
THALLIUM	**19**	**2**	**11%**	**0.130**	**0.180**	**0.791**	**0.155**	**0.360**	**-1.186**	**Shapiro-Wilk**	**Undefined**	0.180	Maximum Detected Concentration
VANADIUM	19	19	100%	3.30	28.9	15.8	15.8	7.83	0.210	Shapiro-Wilk	Normal/Lognormal	21.8	H-UCL
ZINC	19	19	100%	3.75	773	101	101	200	2.73	Shapiro-Wilk	Undefined	171	Non-Parametric UCL
Miscellaneous Parameters (mg/kg)													
CYANIDE	**19**	**7**	**37%**	**0.120**	**0.510**	**0.211**	**0.196**	**0.092**	**1.83**	**Shapiro-Wilk**	**Undefined**	**0.245**	**Non-Parametric UCL**

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

APPENDIX TABLE A-8-10
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Minimum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
2-BUTANONE	**5**	**1**	**19**	**19.0**	**8.30**	**19.0**	**5.99**	**2.23**	**Data are Non-parametric (0.05)**	**20.0**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
ACETONE	**5**	**1**	**87**	**87.0**	**47.1**	**87.0**	**38.8**	**-0.416**	**Data are Normal (0.05)**	**84.1**	**Student-t**	**Max ND > UCL**
CARBON DISULFIDE	5	5	1	26.0	9.60	9.60	9.84	1.57	Data are Normal (0.05)	19.0	Student-t	- -
ETHYLBENZENE	**5**	**1**	**2**	**2.00**	**4.90**	**2.00**	**1.64**	**-2.134**	**Data are Non-parametric (0.05)**	**6.46**	**Student-t or Modified-t UCL**	**UCL > Max Detect**
METHYLENE CHLORIDE	**5**	**1**	**86.5**	**86.5**	**37.6**	**86.5**	**34.0**	**0.912**	**Data are Normal (0.05)**	**70.0**	**Student-t**	**Max ND > UCL**
TOLUENE	**5**	**1**	**1**	**1.00**	**4.80**	**1.00**	**2.14**	**-2.160**	**Data are Non-parametric (0.05)**	**8.97**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
TOTAL XYLENES	5	5	2	11.0	5.20	5.20	3.56	1.39	Data are Normal (0.05)	8.60	Student-t	- -
2-METHYLNAPHTHALENE	**5**	**1**	**39**	**39.0**	**165**	**39.0**	**71.3**	**-2.136**	**Data are Non-parametric (0.05)**	**304**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
ACENAPHTHENE	**5**	**1**	**77**	**77.0**	**169**	**77.0**	**52.2**	**-2.053**	**Data are Non-parametric (0.05)**	**219**	**Student-t or Modified-t UCL**	**UCL > Max Detect**
BENZO(A)PYRENE	**5**	**1**	**44**	**44.0**	**162**	**44.0**	**66.8**	**-2.125**	**Data are Non-parametric (0.05)**	**292**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
BENZO(B)FLUORANTHENE	**5**	**1**	**77**	**77.0**	**169**	**77.0**	**52.2**	**-2.053**	**Data are Non-parametric (0.05)**	**219**	**Student-t or Modified-t UCL**	**UCL > Max Detect**
BENZO(K)FLUORANTHENE	**5**	**1**	**48**	**48.0**	**163**	**48.0**	**65.0**	**-2.119**	**Data are Non-parametric (0.05)**	**290**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
BIS(2-ETHYLHEXYL)PHTHALATE	**5**	**2**	**39**	**150**	**153**	**94.5**	**67.1**	**-1.750**	**Data are Normal (0.05)**	**217**	**Student-t**	**UCL > Max Detect**
FLUORANTHENE	**5**	**2**	**120**	**270**	**195**	**195**	**53.7**	**0.049**	**Data are Normal (0.05)**	**246**	**Student-t**	**Max ND > UCL**
FLUORENE	**5**	**1**	**110**	**110**	**176**	**110**	**37.8**	**-1.883**	**Data are Normal (0.05)**	**212**	**Student-t**	**UCL > Max Detect**
NAPHTHALENE	**5**	**1**	**39**	**39.0**	**165**	**39.0**	**71.3**	**-2.136**	**Data are Non-parametric (0.05)**	**304**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
PHENANTHRENE	**5**	**2**	**58**	**340**	**196**	**199**	**100**	**0.144**	**Data are Normal (0.05)**	**292**	**Student-t**	**Max ND > UCL**
PYRENE	**5**	**2**	**77**	**190**	**170**	**134**	**52.6**	**-2.083**	**Data are Non-parametric (0.05)**	**220**	**Student-t or Modified-t UCL**	**UCL > Max Detect**
4,4'-DDD	**5**	**3**	**2.2**	**36.0**	**9.41**	**14.4**	**14.9**	**2.20**	**Data Follow Gamma Distribution (0.05)**	**46.8**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
4,4'-DDE	**5**	**3**	**1.8**	**83.0**	**23.7**	**38.3**	**35.3**	**1.68**	**Data Follow Gamma Distribution (0.05)**	**162**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
4,4'-DDT	**5**	**2**	**5.7**	**52.0**	**12.7**	**28.9**	**22.0**	**2.21**	**Data Follow Gamma Distribution (0.05)**	**76.1**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
DIELDRIN	**5**	**1**	**1.6**	**1.60**	**2.28**	**1.60**	**0.874**	**1.96**	**Data Follow Gamma Distribution (0.05)**	**3.37**	**Approximate Gamma 95% UCL**	**UCL > Max Detect**
ALUMINUM	5	5	11000	24250	16990	16990	4775	0.627	Data are Normal (0.05)	21543	Student-t	- -
ANTIMONY	**5**	**3**	**2.5**	**6.70**	**3.52**	**5.03**	**2.60**	**0.499**	**Data are Normal (0.05)**	**6.00**	**Student-t**	**- -**
ARSENIC	5	5	1.5	15.1	7.15	7.15	5.76	0.624	Data are Normal (0.05)	12.6	Student-t	- -
BARIUM	5	5	20	175	77.6	77.6	67.7	0.902	Data are Normal (0.05)	142	Student-t	- -
BERYLLIUM	5	5	0.18	0.260	0.206	0.206	0.032	1.66	Data are Normal (0.05)	0.237	Student-t	- -
CADMIUM	**5**	**3**	**2.4**	**9.00**	**4.16**	**6.70**	**4.36**	**0.456**	**Data are Normal (0.05)**	**8.32**	**Student-t**	**- -**
CALCIUM	5	4	254	5870	1725	2093	2364	2.02	Data Follow Gamma Distribution (0.05)	7999	Approximate Gamma 95% UCL	UCL > Max Detect
CHROMIUM	5	5	10.5	36.9	23.7	23.7	10.5	-0.053	Data are Normal (0.05)	33.7	Student-t	- -
COBALT	5	5	1.1	9.60	3.66	3.66	3.59	1.55	Data are Normal (0.05)	7.09	Student-t	- -
COPPER	5	5	4.8	3620	759	759	1600	2.23	Data Follow Gamma Distribution (0.05)	35428	Adjusted Gamma 95% UCL	UCL > Max Detect
IRON	5	5	6670	74800	29412	29412	28186	1.34	Data are Normal (0.05)	56284	Student-t	- -
LEAD	5	5	6.8	766	286	286	355	0.760	Data are Normal (0.05)	625	Student-t	- -
MAGNESIUM	5	5	198	586	344	344	155	1.13	Data are Normal (0.05)	492	Student-t	- -
MANGANESE	5	5	46.95	638	261	261	234	1.27	Data are Normal (0.05)	484	Student-t	- -
MERCURY	5	4	0.17	0.430	0.240	0.285	0.138	0.129	Data are Normal (0.05)	0.371	Student-t	- -
NICKEL	5	5	3.35	35.9	14.5	14.5	14.9	0.938	Data are Normal (0.05)	28.6	Student-t	- -
POTASSIUM	5	4	166	412	245	287	130	-0.062	Data are Normal (0.05)	369	Student-t	- -
SILVER	**5**	**3**	**0.79**	**4.30**	**1.81**	**2.83**	**1.90**	**0.680**	**Data are Normal (0.05)**	**3.62**	**Student-t**	**- -**
SODIUM	5	4	207	514	282	324	152	0.870	Data are Normal (0.05)	426	Student-t	- -
VANADIUM	5	5	19	65.4	31.3	31.3	19.5	2.02	Data Follow Gamma Distribution (0.05)	58.9	Approximate Gamma 95% UCL	- -
ZINC	5	5	10.6	895	316	316	383	1.07	Data are Normal (0.05)	681	Student-t	- -
CYANIDE	**4**	**1**	**0.14**	**0.140**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**	**NA(1)**

Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
NA(1) - Not applicable, there are an insufficient number of samples to calculate statistics.
1/2 the detection limit was used for B qualified data.

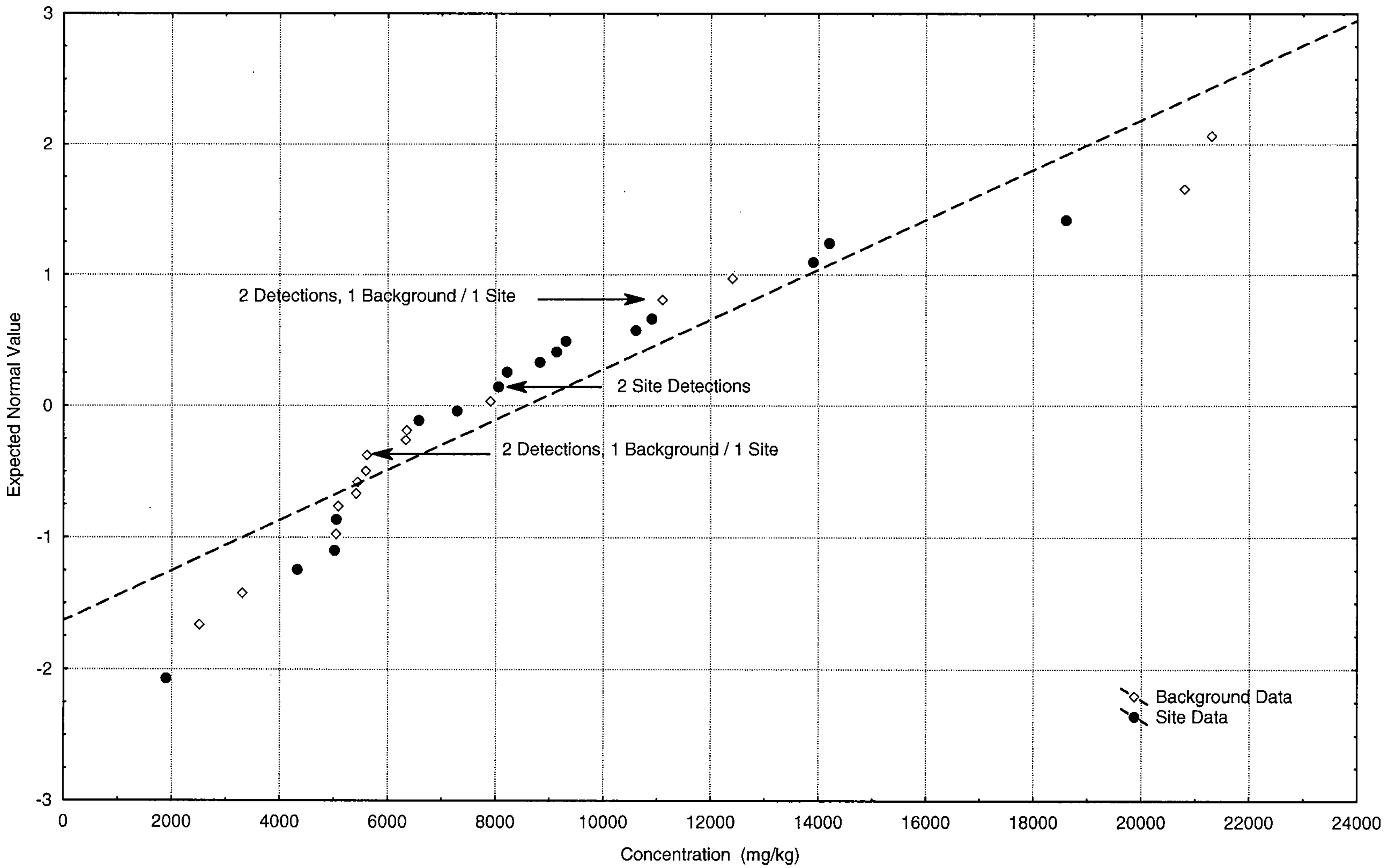
Associated Samples

16SS0201
16SS0302
16SS0403-AVG
16SS0604
16SS1005

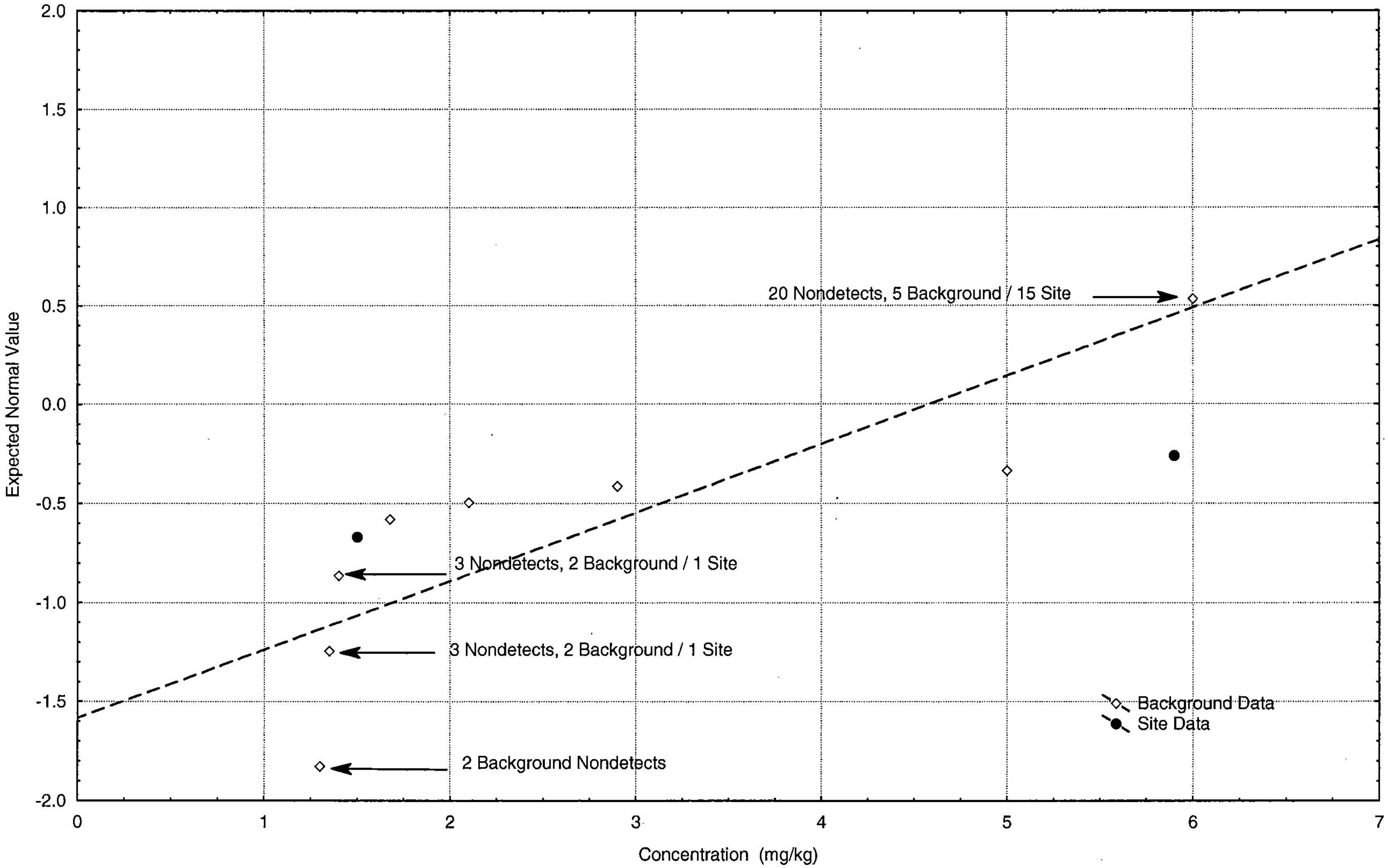
APPENDIX TABLE A-8-11
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 16 SURFACE SOIL																			
ARSENIC	19/19	15/15	34/34	0%	PASS	12.1	3.7	2.82	1.54	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	4.56	0.0405	**YES**	---	**YES**
BARIUM	19/19	15/15	34/34	0%	PASS	257	33.9 J	36.0	12.7	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	4.38	0.0444	**YES**	---	**YES**
BERYLLIUM	14/19	8/15	22/34	35%	PASS	0.23 J	0.35 J	0.209	0.195	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	0.945	0.345	NO	PASS	NO
CADMIUM	16/19	**3/15**	19/34	44%	**FAIL**	7.6	0.9 J	1.14	0.395	---	---	---	---	Proportions	1.49	0.0678	NO	PASS	NO
CHROMIUM	19/19	15/15	34/34	0%	PASS	29.2	16.3	10.5	6.12	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	5.25	0.0287	**YES**	---	**YES**
COPPER	18/19	12/15	30/34	12%	PASS	202	8.5	30.5	3.97	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	3.18	0.00149	**YES**	---	**YES**
LEAD	19/19	15/15	34/34	0%	PASS	759	9.8 J	103	5.49	LOGNORMAL	NORMAL	**FAIL**	---	WRS	3.64	0.000270	**YES**	---	**YES**
NICKEL	10/19	6/15	16/34	53%	**FAIL**	26	5.9 J	5.48	2.65	---	---	**---**	---	Proportions	1.245	0.107	NO	PASS	NO
THALLIUM	2/19	1/15	3/34	91%	**FAIL**	0.18 J	0.16 J	0.791	0.446	---	---	**---**	---	Proportions	---	---	NO	PASS	NO
VANADIUM	19/19	15/15	34/34	0%	PASS	28.9	31.9	15.8	12.0	NORMAL	UNDEFINED	**FAIL**	---	WRS	1.63	0.103	NO	PASS	NO
SITE 16 SUBSURFACE SOIL																			
CHROMIUM	5/5	14/14	19/19	0%	PASS	36.9	30	23.7	11.4	NORMAL	LOGNORMAL	**FAIL**	---	WRS	2.04	0.0417	**YES**	---	**YES**
COPPER	5/5	14/14	19/19	0%	PASS	3620	9.6	759	4.43	LOGNORMAL	LOGNORMAL	PASS	**FAIL**	Satterthwaite T	2.16	0.0486	**YES**	---	**YES**

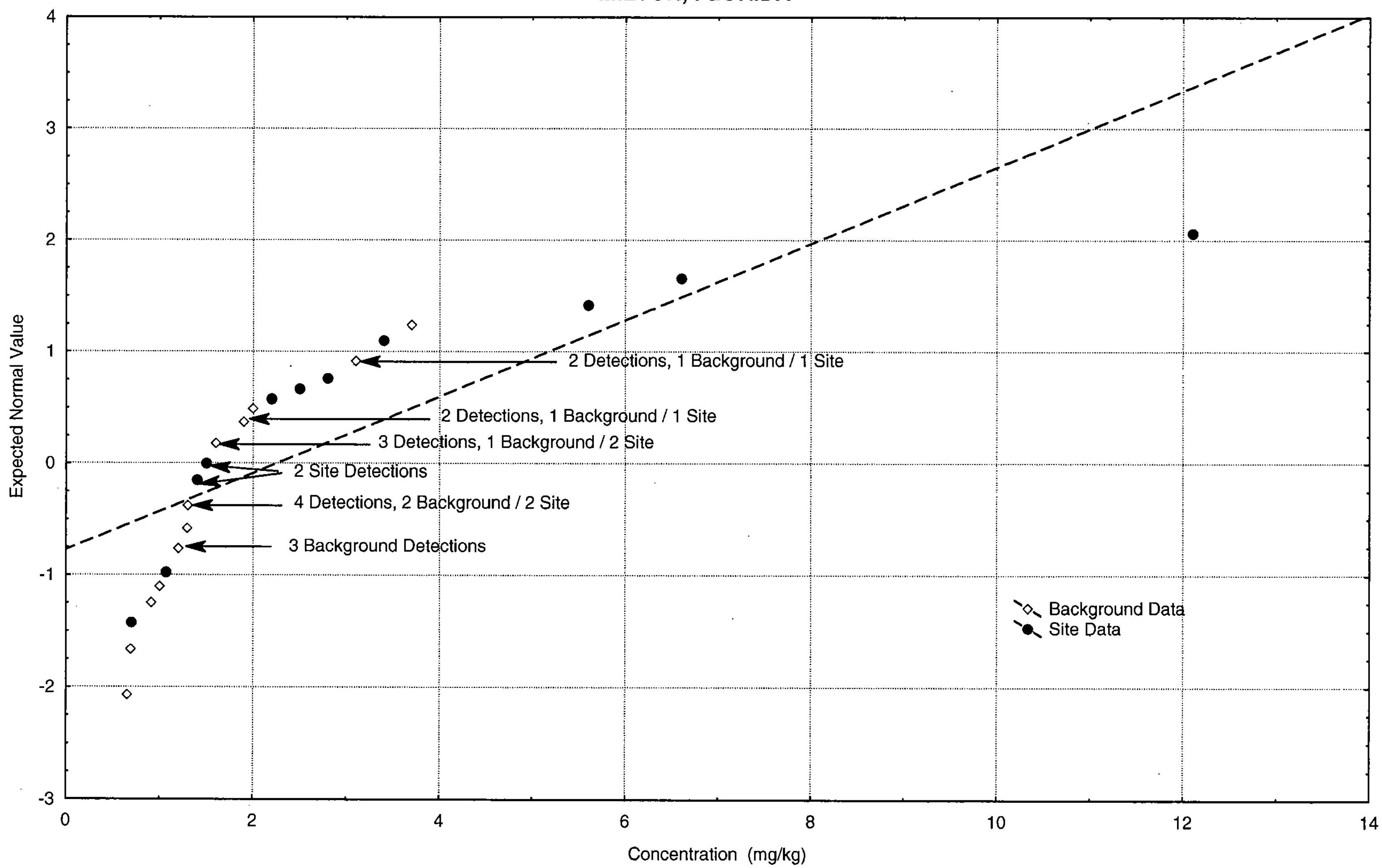
APPENDIX FIGURE A-8-1
NORMAL PROBABILITY PLOT - ALUMINUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



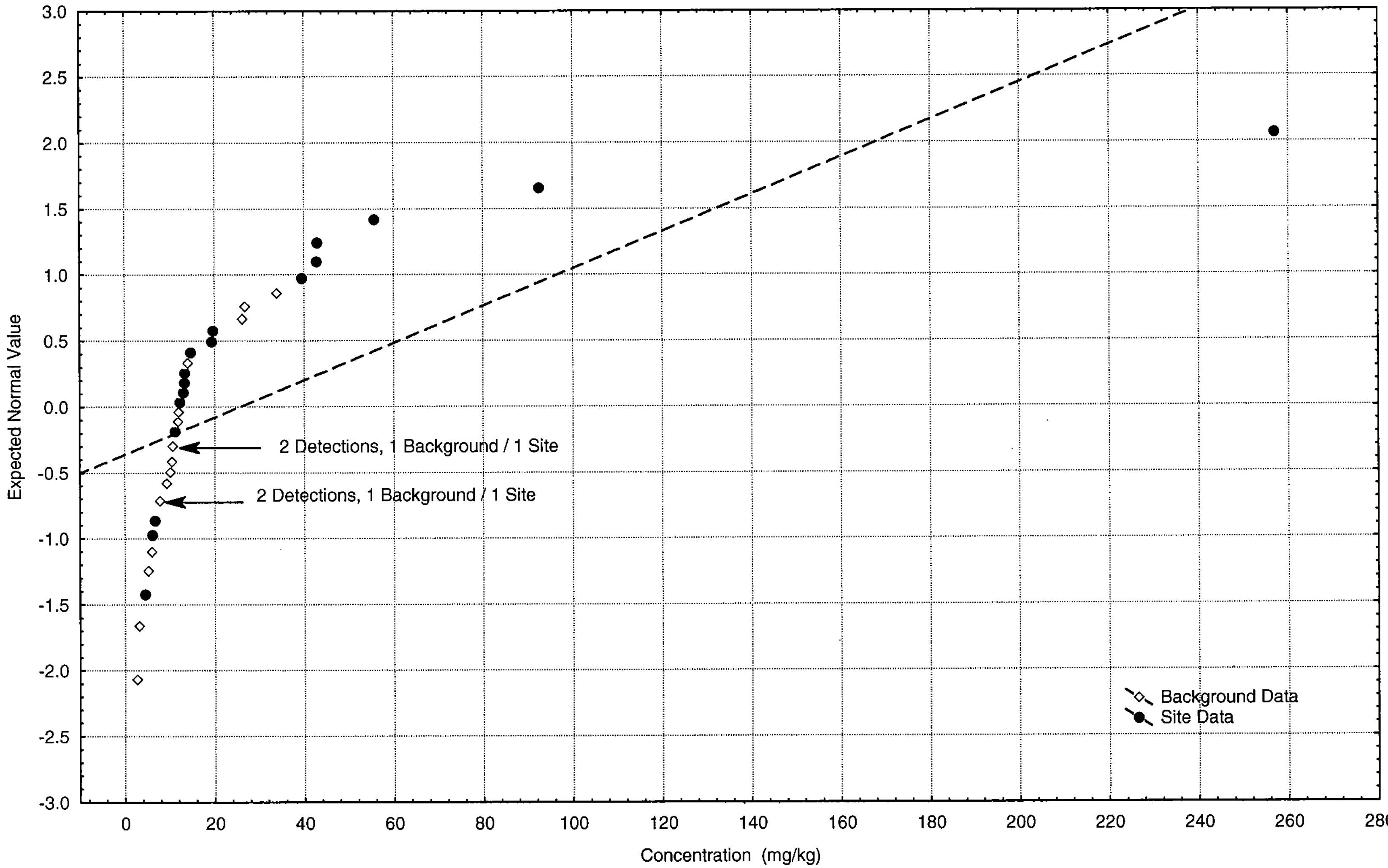
APPENDIX FIGURE A-8-2
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



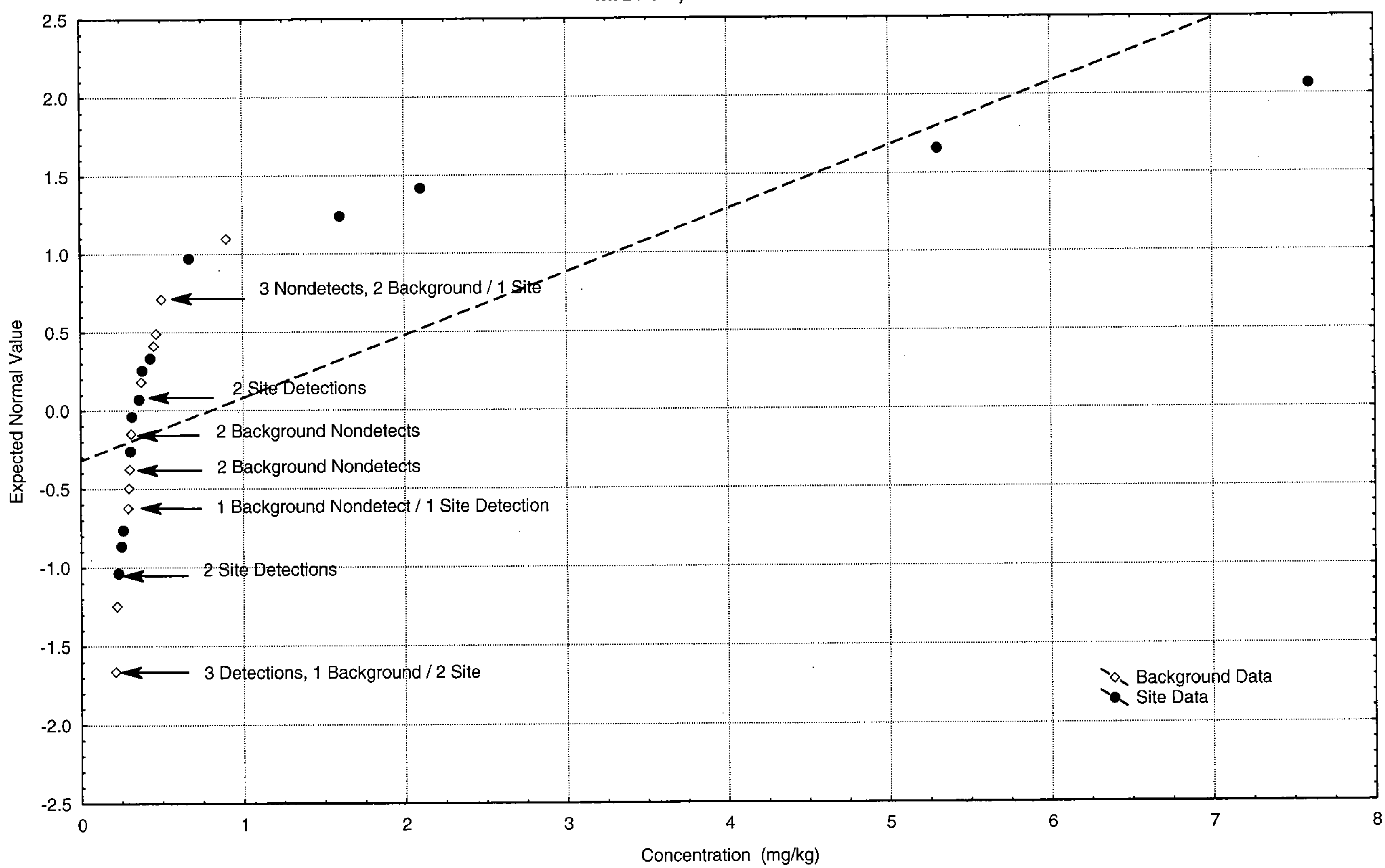
APPENDIX FIGURE A-8-3
NORMAL PROBABILITY PLOT - ARSENIC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



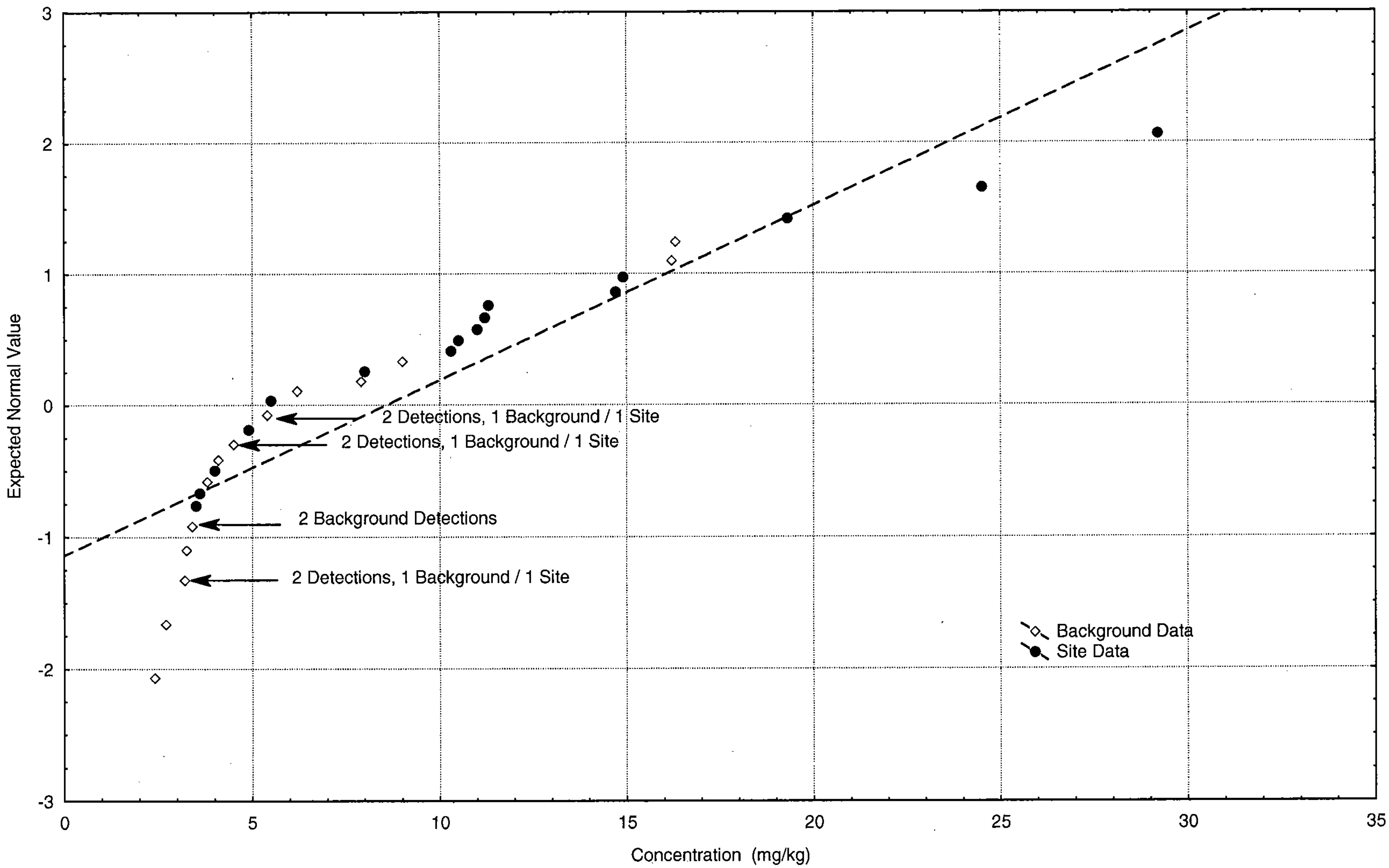
APPENDIX FIGURE A-8-4
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



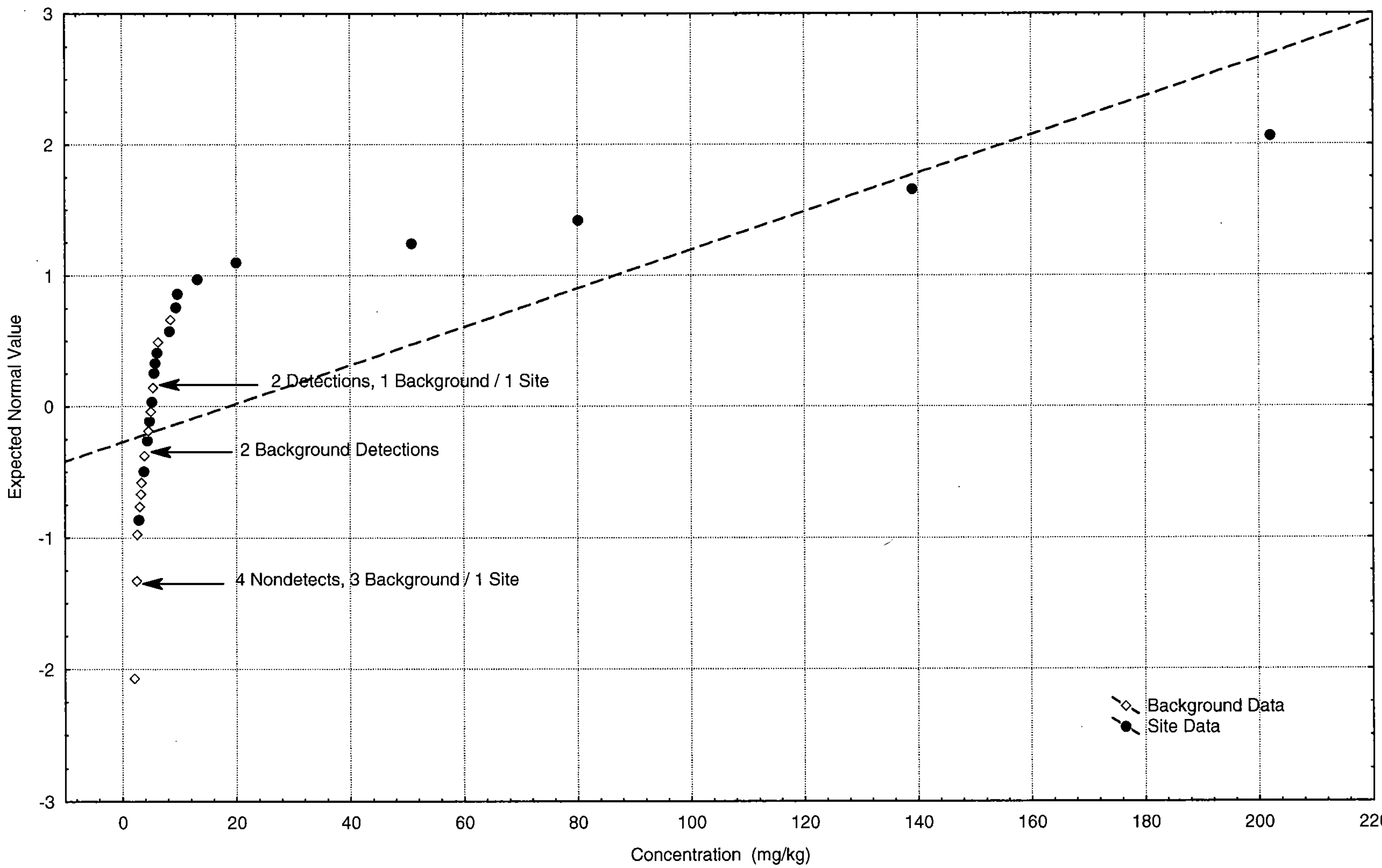
APPENDIX FIGURE A-8-5
NORMAL PROBABILITY PLOT - CADMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



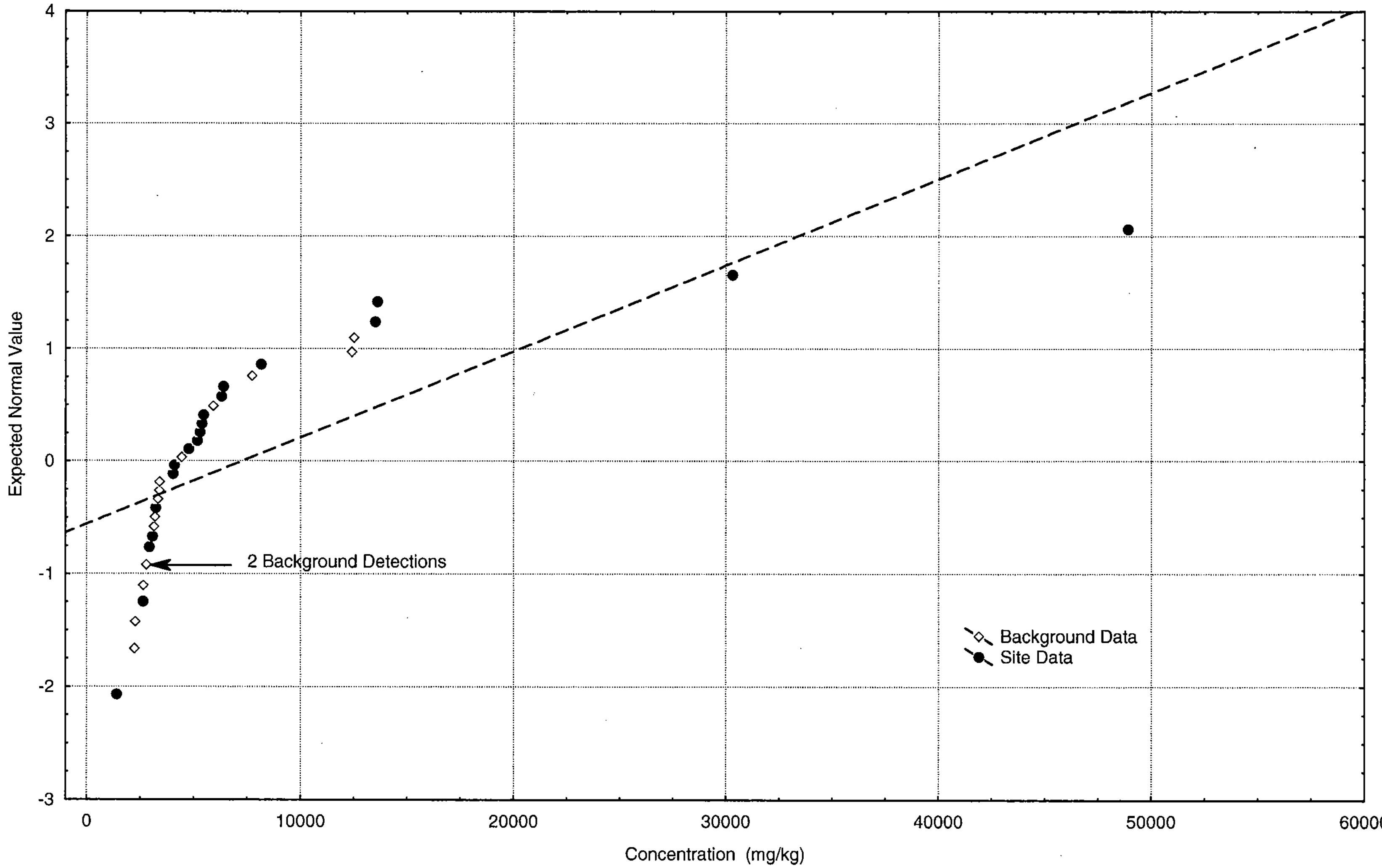
APPENDIX FIGURE A-8-6
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



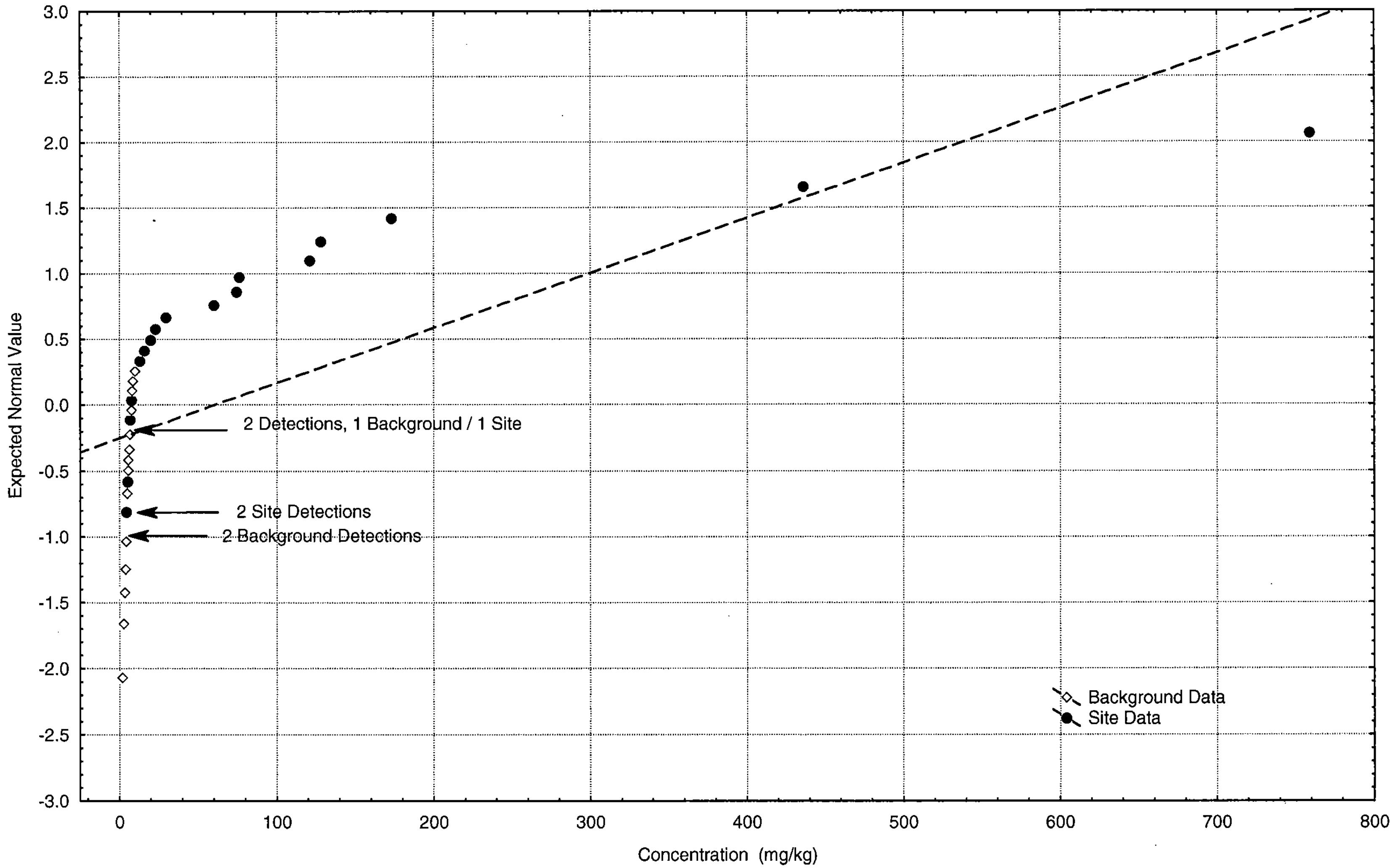
APPENDIX FIGURE A-8-7
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



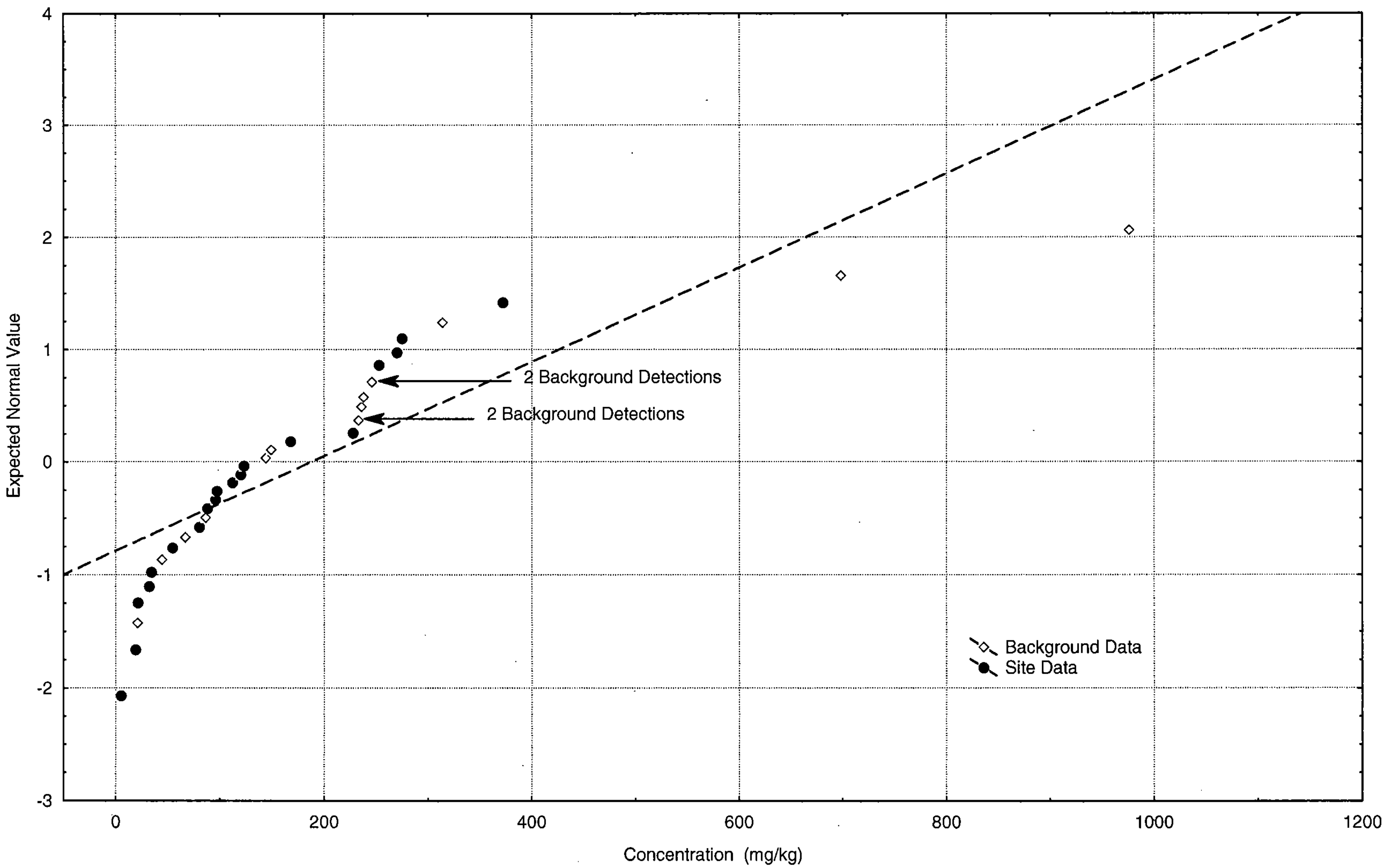
APPENDIX FIGURE A-8-8
NORMAL PROBABILITY PLOT - IRON - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



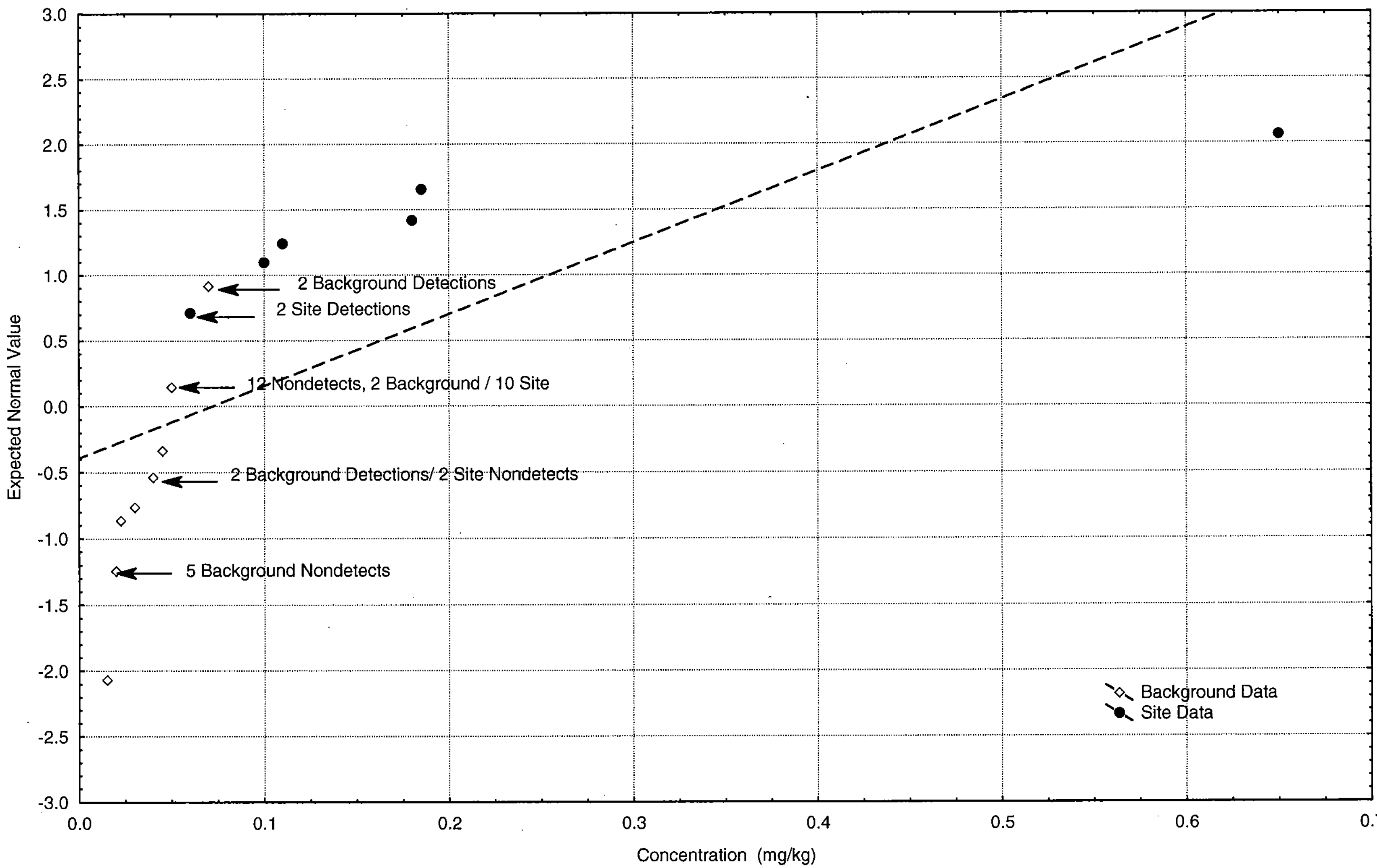
APPENDIX FIGURE A-8-9
NORMAL PROBABILITY PLOT - LEAD - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



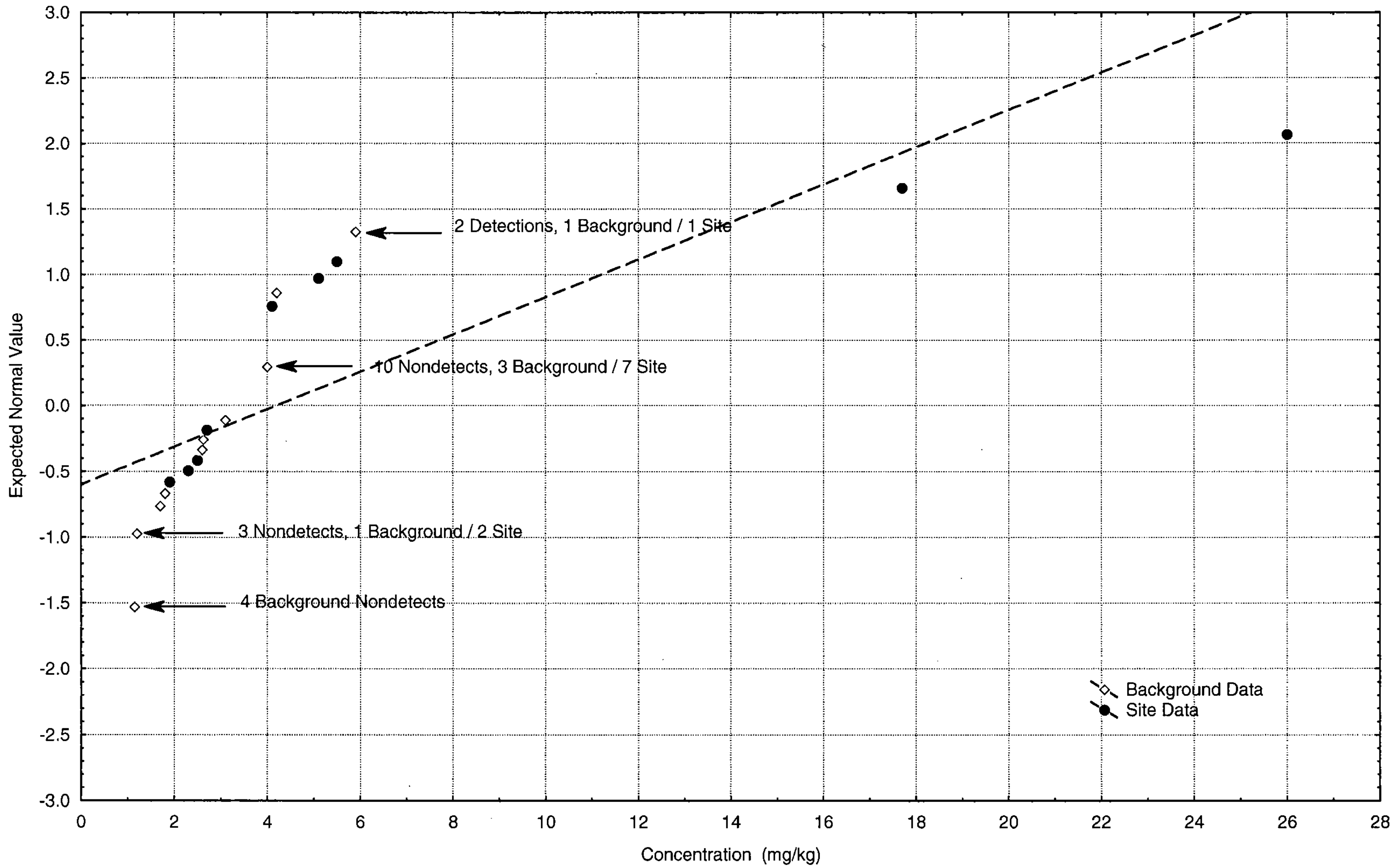
APPENDIX FIGURE A-8-10
NORMAL PROBABILITY PLOT - MANGANESE - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



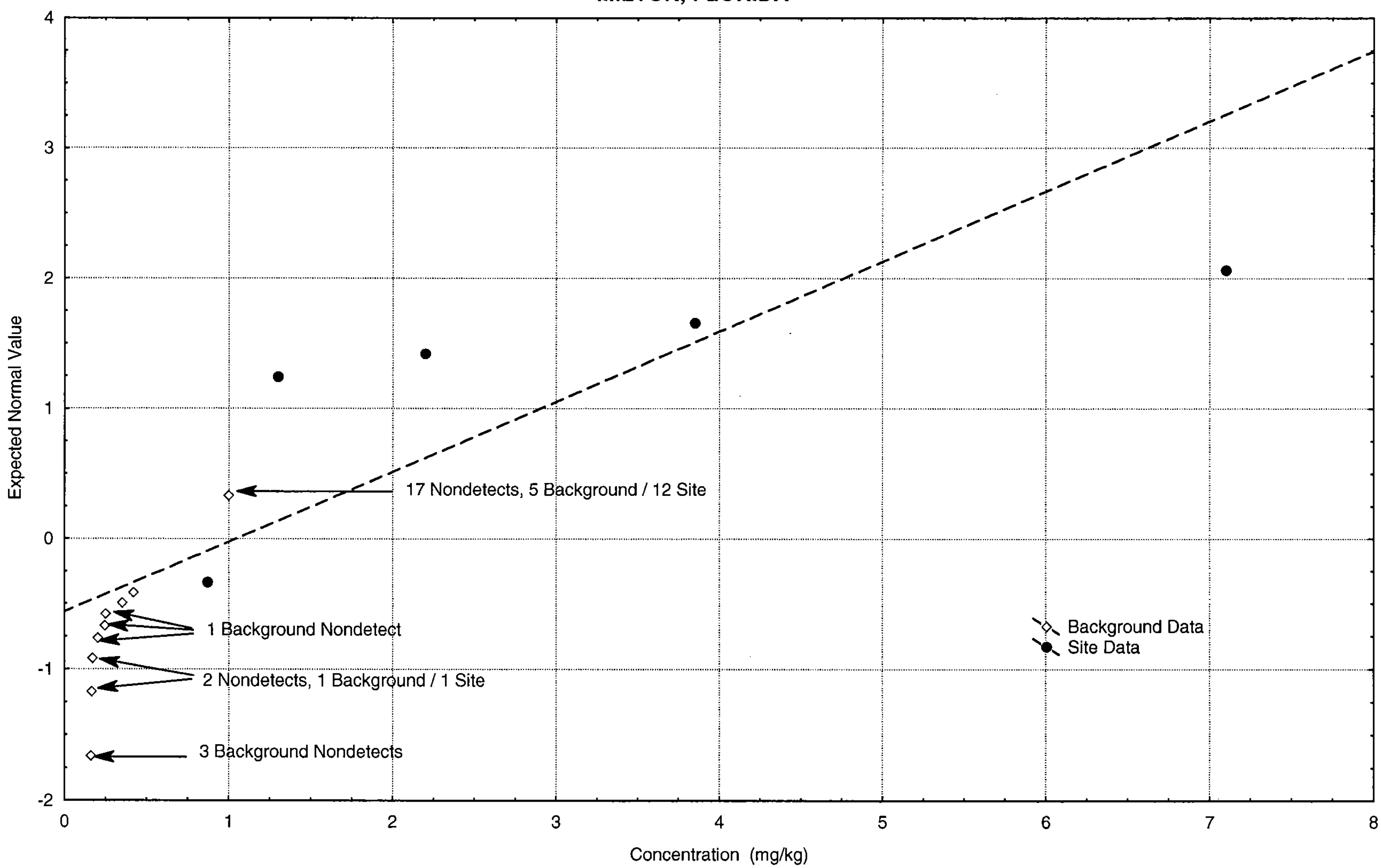
APPENDIX FIGURE A-8-11
NORMAL PROBABILITY PLOT - MERCURY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



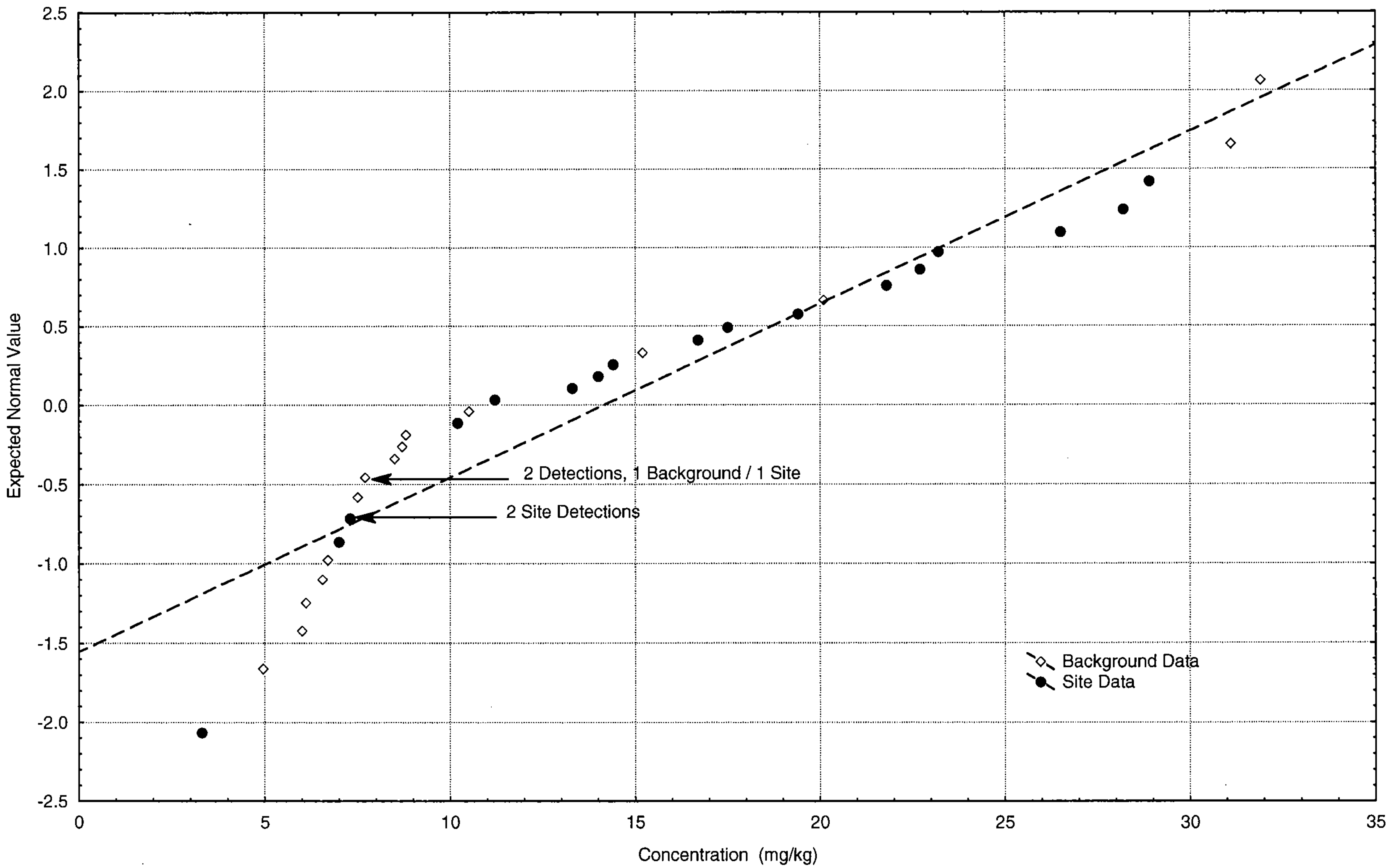
APPENDIX FIGURE A-8-12
NORMAL PROBABILITY PLOT - NICKEL - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



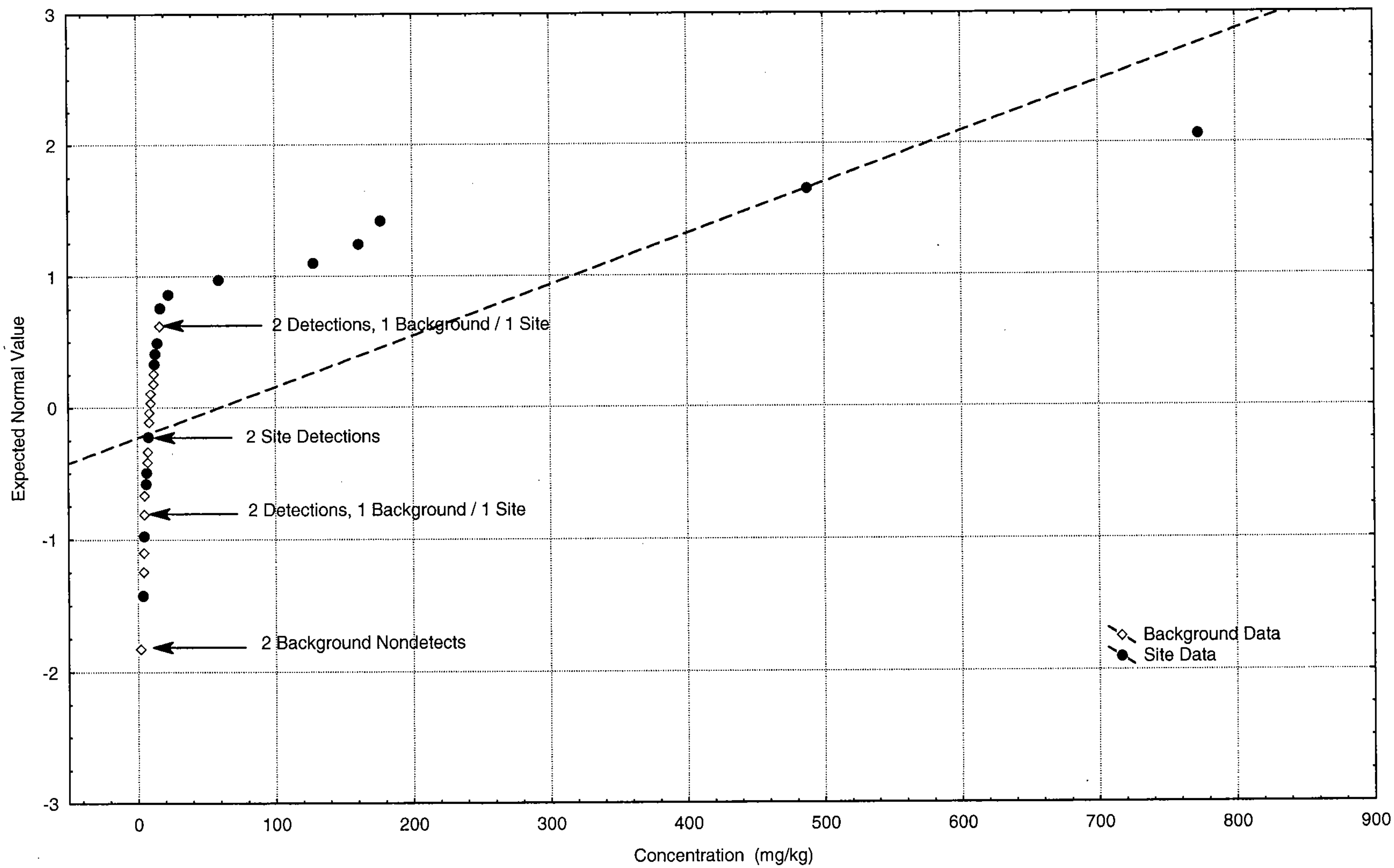
APPENDIX FIGURE A-8-13
NORMAL PROBABILITY PLOT - SILVER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



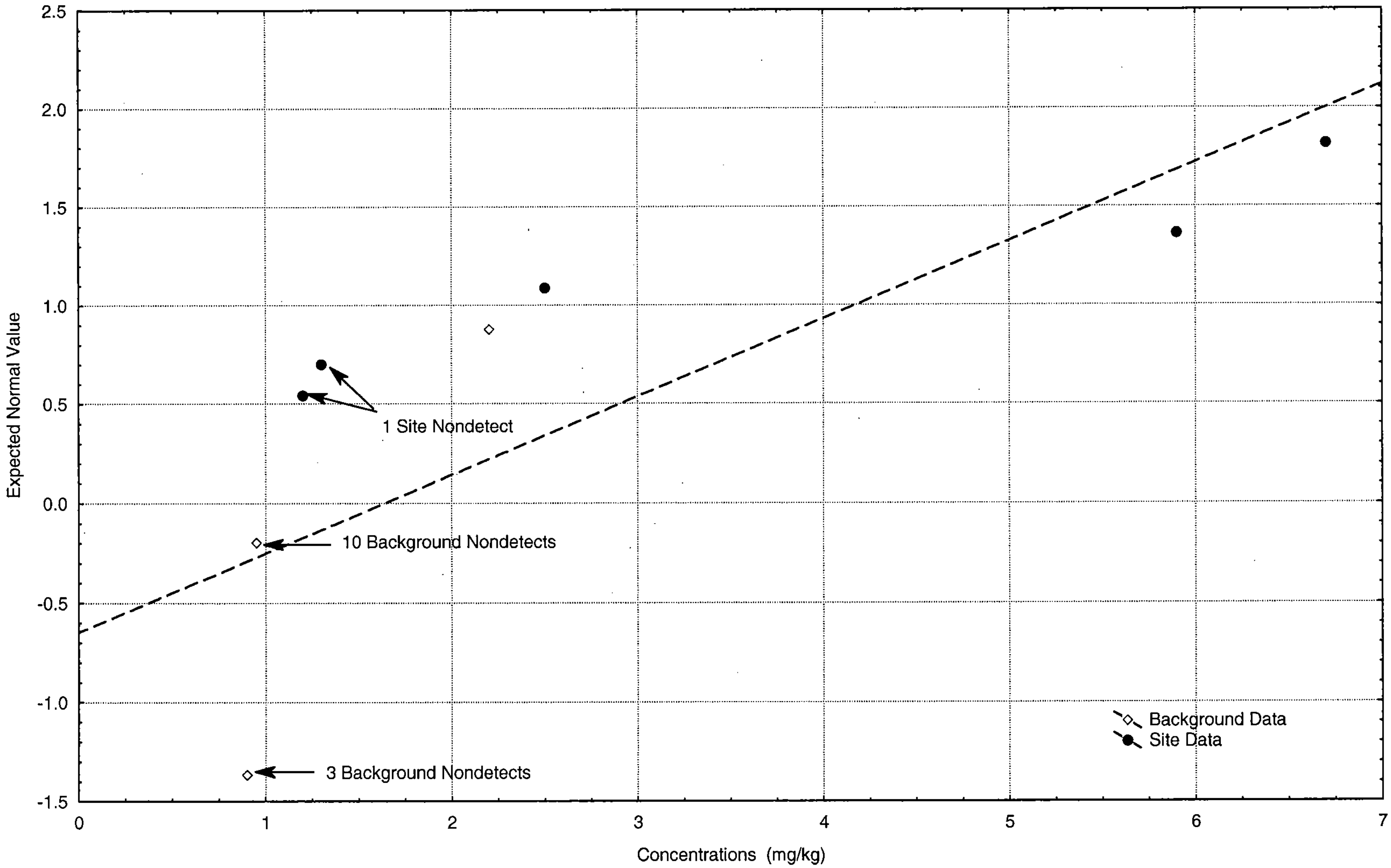
APPENDIX FIGURE A-8-14
NORMAL PROBABILITY PLOT - VANADIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



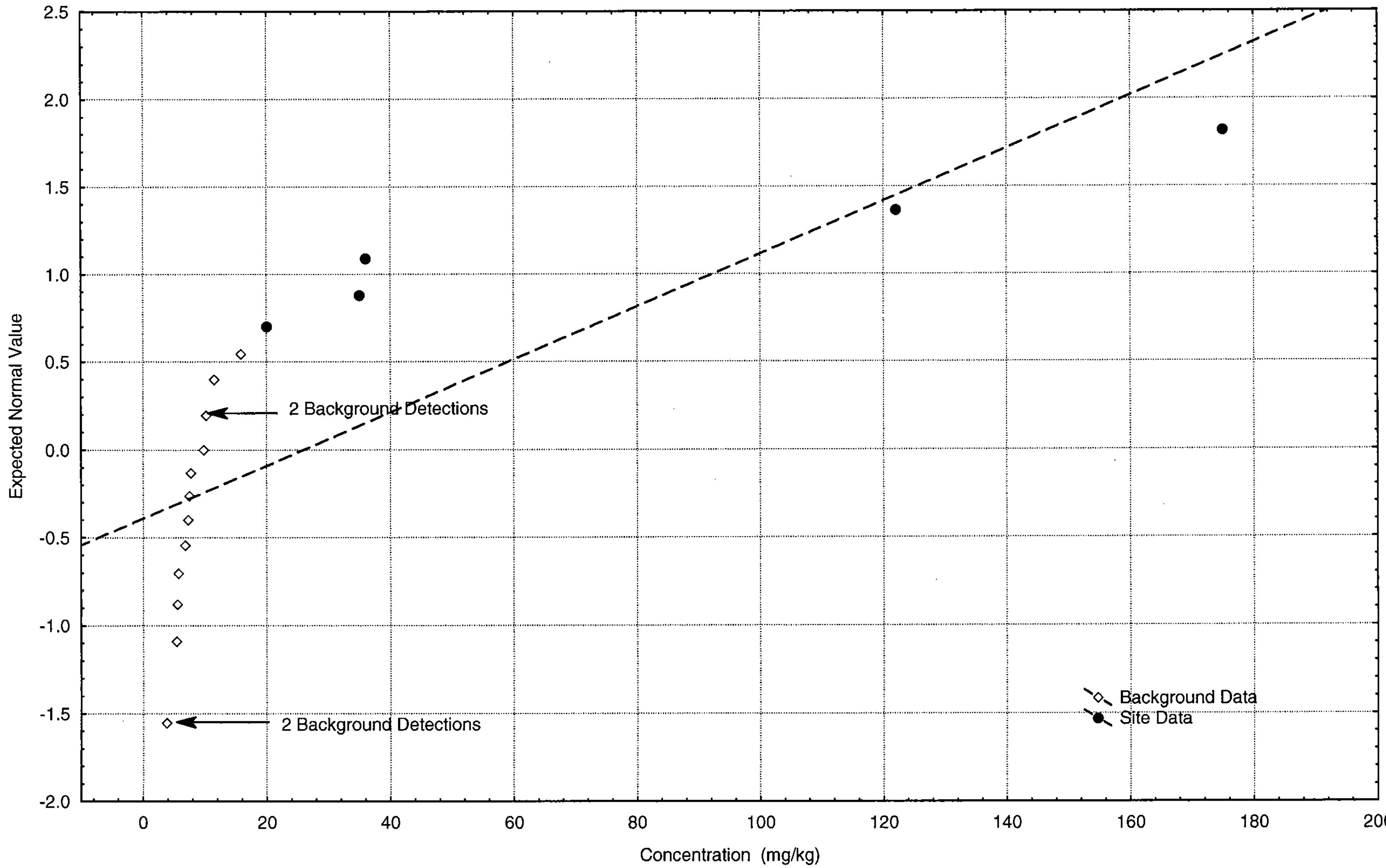
APPENDIX FIGURE A-8-15
NORMAL PROBABILITY PLOT - ZINC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



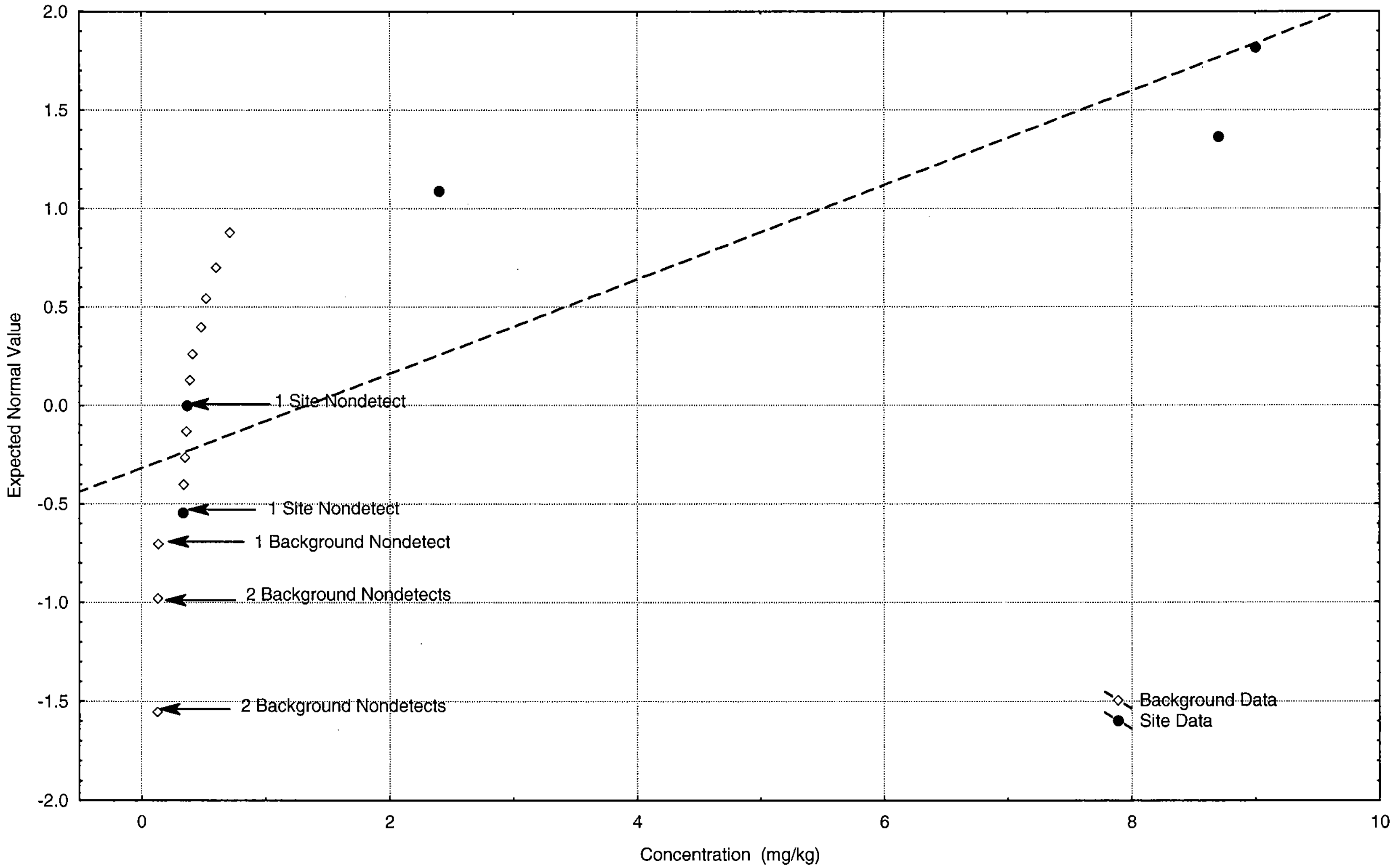
APPENDIX FIGURE A-8-16
NORMAL PROBABILITY PLOT - ANTIMONY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



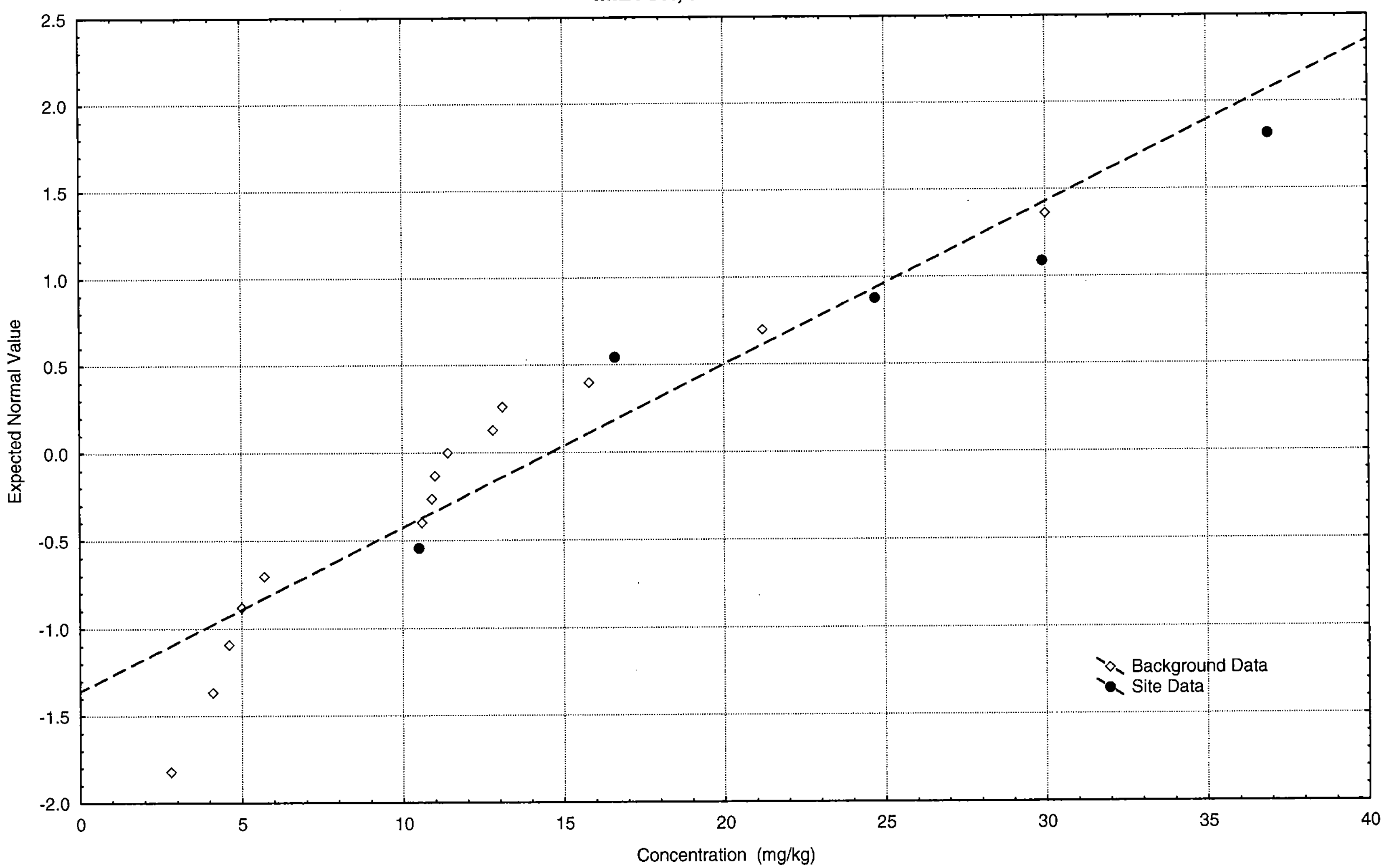
APPENDIX FIGURE A-8-17
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



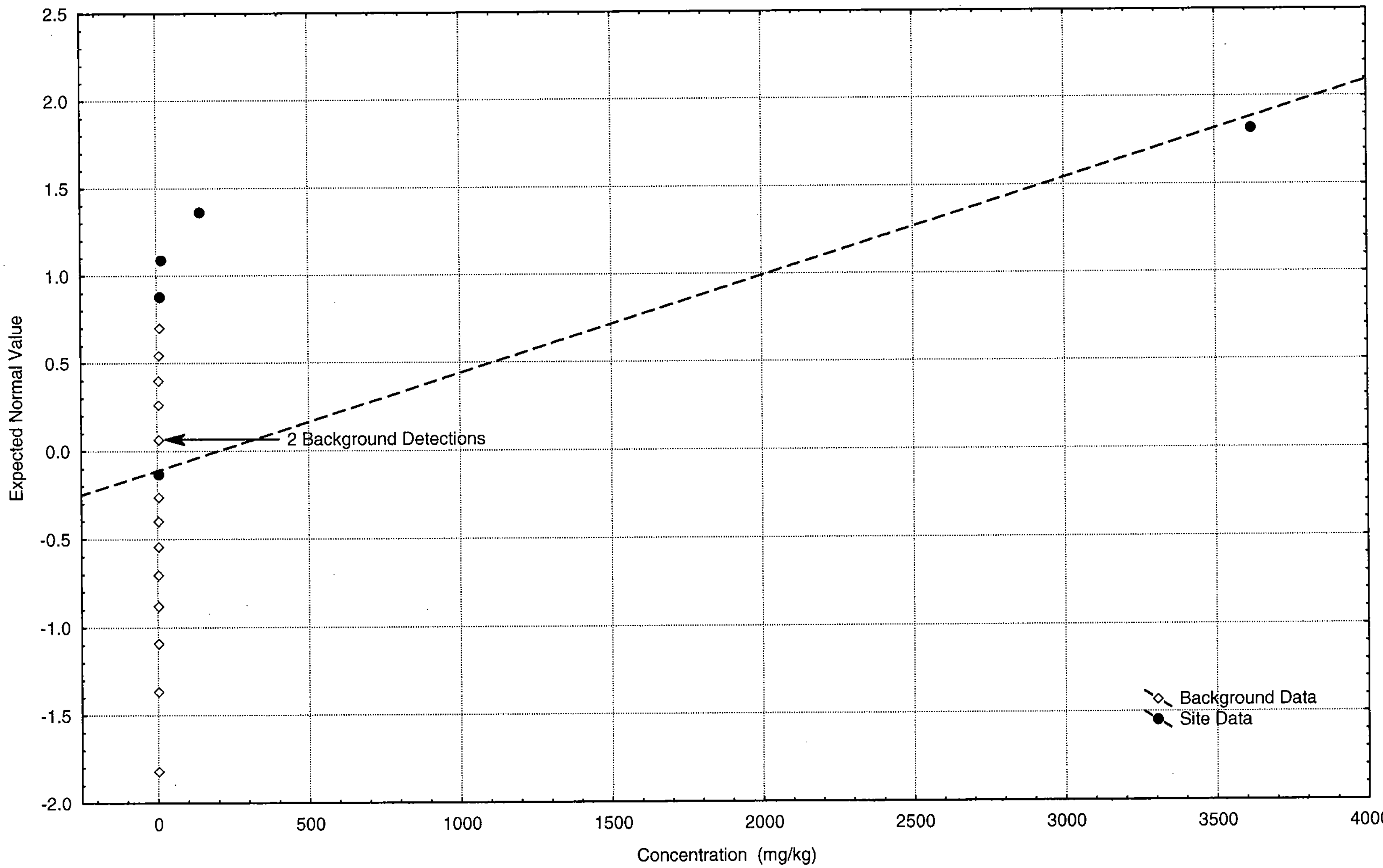
APPENDIX FIGURE A-8-18
NORMAL PROBABILITY PLOT - CADMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



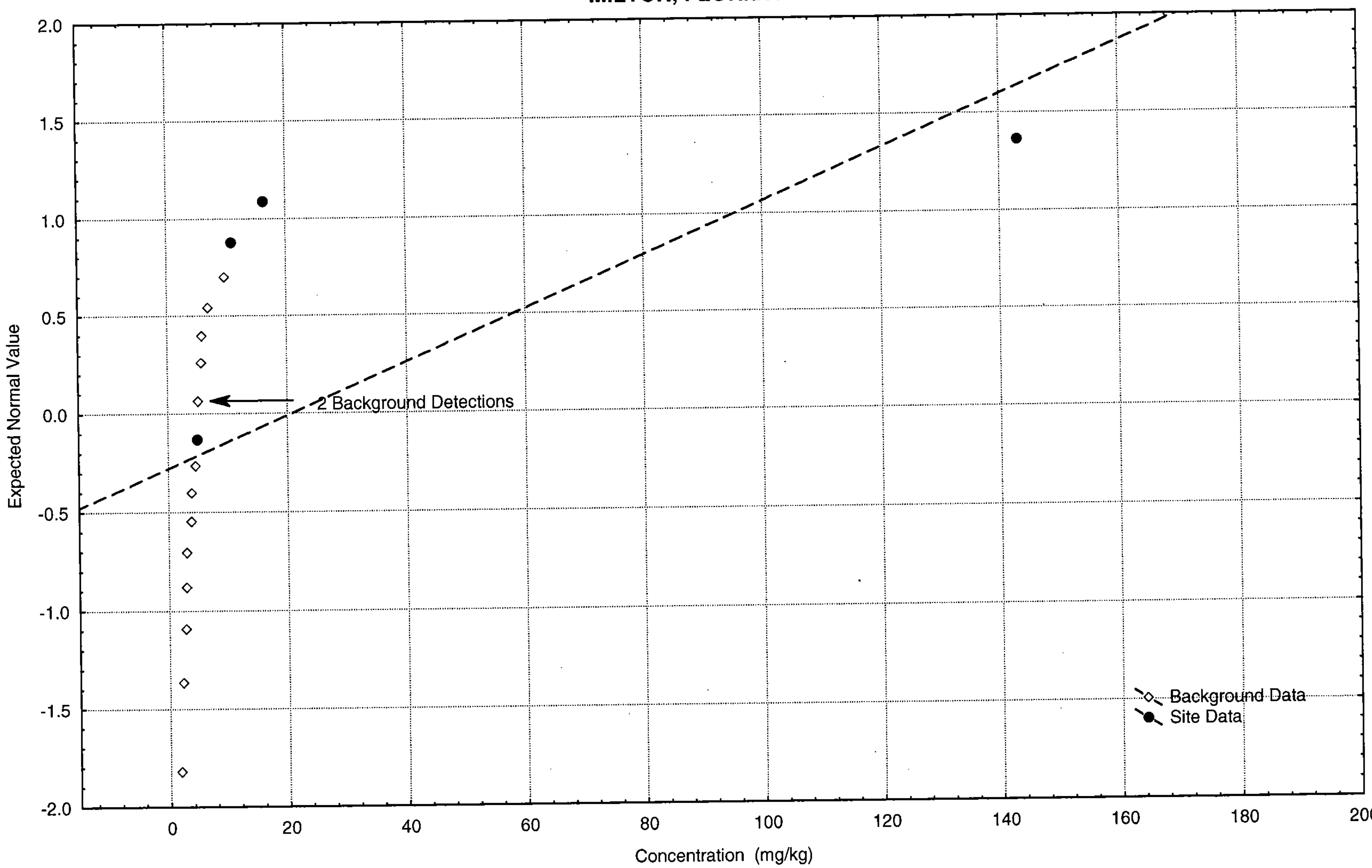
APPENDIX FIGURE A-8-19
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



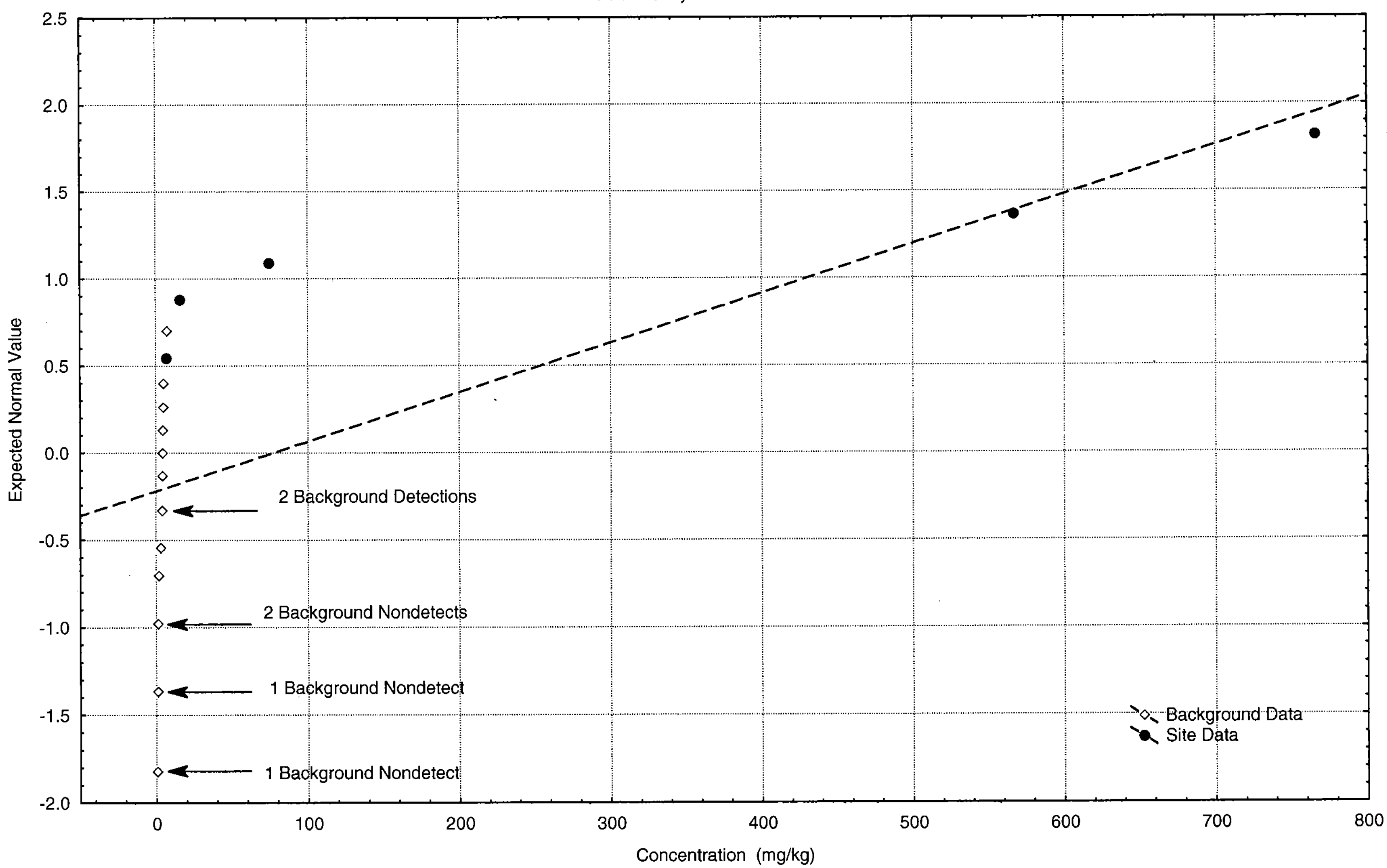
APPENDIX FIGURE A-8-20
NORMAL PROBABILITY PLOT - COPPER - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



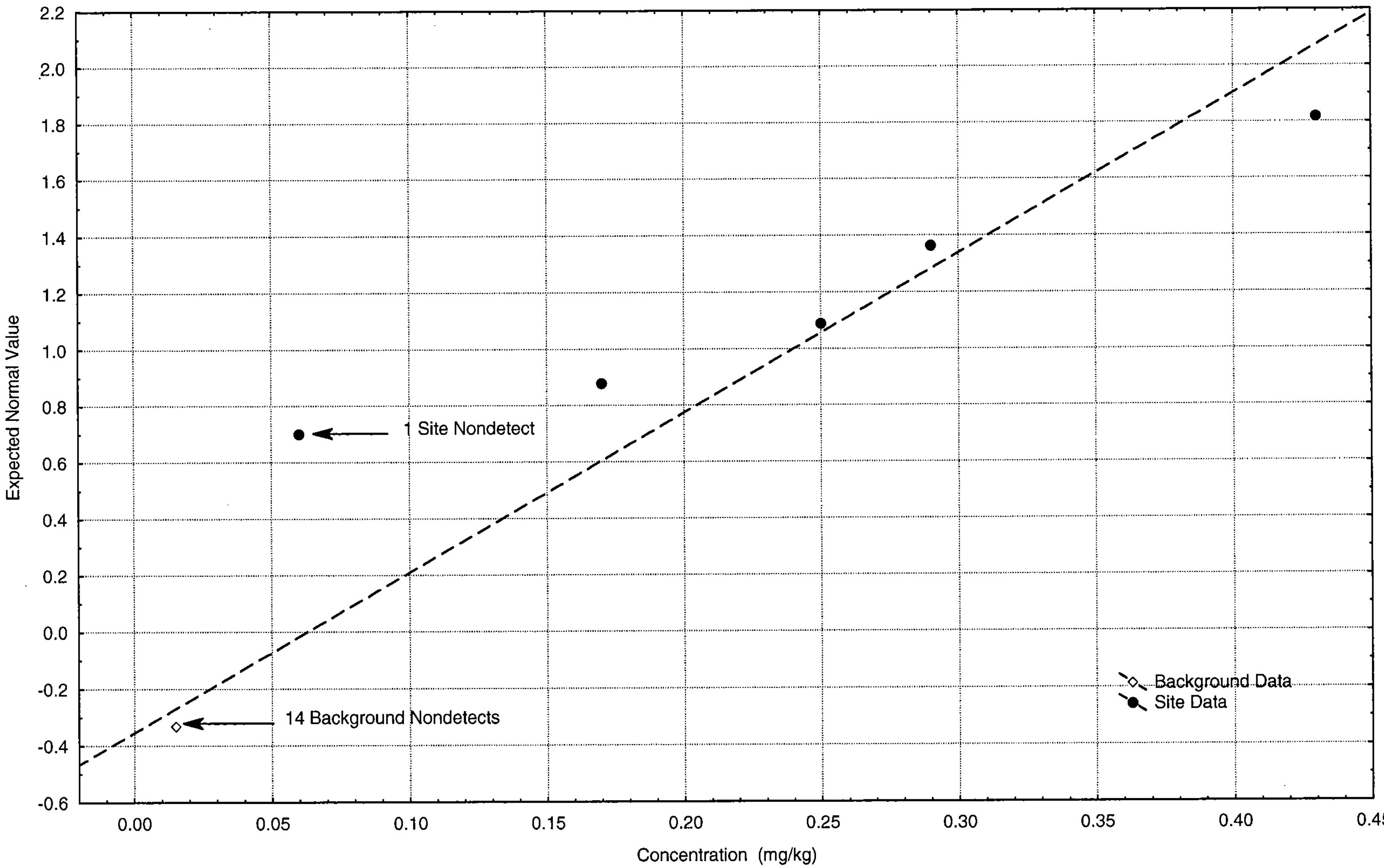
APPENDIX FIGURE A-8-21
NORMAL PROBABILITY PLOT - COPPER (excluding 16SS1005) - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



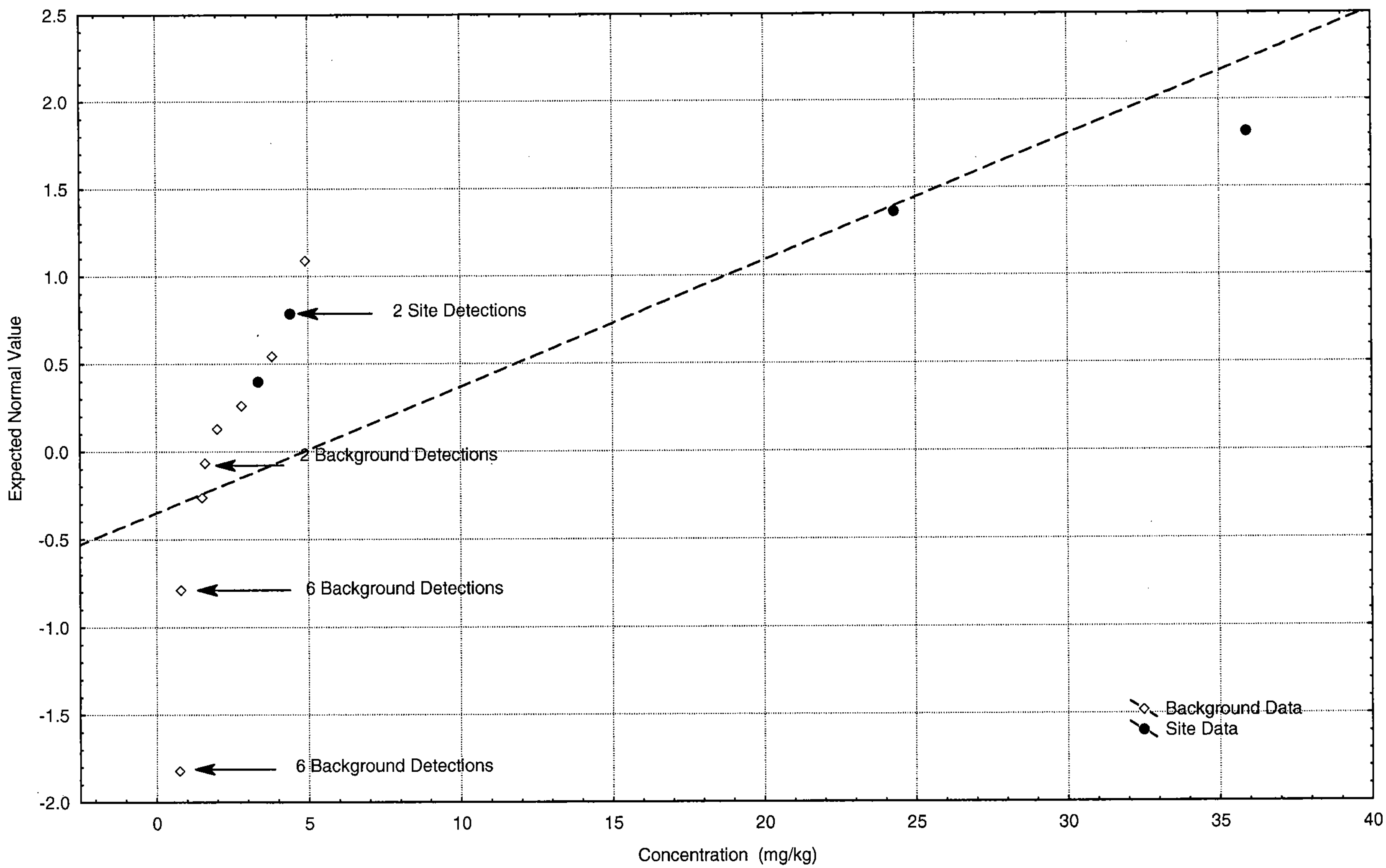
APPENDIX FIGURE A-8-22
NORMAL PROBABILITY PLOT - LEAD - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-8-23
NORMAL PROBABILITY PLOT - MERCURY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-8-24
NORMAL PROBABILITY PLOT - NICKEL - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.9

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 17, CRASH CREW TRAINING AREA A

SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11	17-SL-11	17-SL-12
NSAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11-D	17-SL-12
SAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11A	17-SL-12
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)														
1,1,1-TRICHLOROETHANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
1,1,2,2-TETRACHLOROETHANE	6 U	730 UJ	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 UJ	4015 UJ	7300 UJ	7 U
1,1,2-TRICHLOROETHANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
1,1-DICHLOROETHANE	6 UJ	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
1,1-DICHLOROETHENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
1,2-DICHLOROETHANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
1,2-DICHLOROPROPANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
2-BUTANONE	12 UJ	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	55
2-HEXANONE	12 UJ	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
4-METHYL-2-PENTANONE	12 U	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
ACETONE	12 U	1500 UJ	36 UJ	12 U	36 UJ	88 UJ	13 UJ	12 UJ	11 UJ	12 U	1500 UJ	8250 UJ	15000 UJ	270 UJ
BENZENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
BROMODICHLOROMETHANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
BROMOFORM	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 UJ
BROMOMETHANE	12 U	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
CARBON DISULFIDE	2 J	730 U	6 U	1 J	6 U	11	1 J	1 J	1 J	6 U	730 U	4015 U	7300 U	2 J
CARBON TETRACHLORIDE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
CHLOROBENZENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
CHLORODIBROMOMETHANE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
CHLOROETHANE	12 U	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
CHLOROFORM	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
CHLOROMETHANE	12 U	1500 U	12 UJ	12 UJ	12 UJ	11 UJ	13 UJ	12 UJ	12 UJ	12 UJ	1500 U	8250 U	15000 U	15 UJ
CIS-1,3-DICHLOROPROPENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
ETHYLBENZENE	6 U	730 U	6 U	6 U	6 U	3 J	7 U	6 U	6 U	6 U	5000	8500	12000	2 J
METHYLENE CHLORIDE	51 UJ	730 UJ	8 UJ	7 UJ	12 UJ	96 UJ	9 UJ	61 UJ	33 UJ	34 UJ	730 UJ	4015 UJ	7300 UJ	48 UJ
STYRENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TETRACHLOROETHENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TOLUENE	6 U	730 U	6 U	6 U	6 U	2 J	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TOTAL 1,2-DICHLOROETHENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TOTAL XYLENES	5 J	730 U	6 U	6 U	6 U	11	7 U	4 J	4 J	3 J	30000	57000	84000	38
TRANS-1,3-DICHLOROPROPENE	6 U	730 U	6 U	6 U	6 U	5 U	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TRICHLOROETHENE	6 U	160 J	6 U	6 U	6 U	5 U	7 U	2 J	6 U	6 U	730 U	4015 U	7300 U	7 U
VINYL ACETATE	12 UJ	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
VINYL CHLORIDE	12 U	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	15 U
Semivolatile Organics (ug/kg)														
1,2,4-TRICHLOROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
1,2-DICHLOROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
1,3-DICHLOROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
1,4-DICHLOROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11	17-SL-11	17-SL-12
NSAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11-D	17-SL-12
SAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11A	17-SL-12
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1900 U	1900 U	1900 U	1900 U	2000 U	3500 U	1900 U	2000 U	1900 U	1900 U	5600 U	6500 U	7400 U	7400 U
2,4,6-TRICHLOROPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2,4-DICHLOROPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2,4-DIMETHYLPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2,4-DINITROPHENOL	1900 U	1900 U	1900 U	1900 UJ	2000 UJ	3500 UJ	1900 UJ	2000 UJ	1900 UJ	1900 U	5600 UJ	6500 UJ	7400 UJ	7400 UJ
2,4-DINITROTOLUENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2,6-DINITROTOLUENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2-CHLORONAPHTHALENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2-CHLOROPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2-METHYLNAPHTHALENE	380 U	390 U	390 U	390 U	400 U	190 J	400 U	410 U	390 U	380 U	1400	2250	3100	1500 U
2-METHYLPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
2-NITROANILINE	1900 U	1900 U	1900 U	1900 U	2000 U	3500 U	1900 U	2000 U	1900 U	1900 U	5600 U	6500 U	7400 U	7400 U
2-NITROPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
3,3'-DICHLOROBENZIDINE	770 U	780 U	790 U	790 UJ	810 UJ	1500 UJ	800 UJ	820 UJ	780 UJ	770 UJ	2300 U	2700 U	3100 U	3100 UJ
3-NITROANILINE	1900 U	1900 U	1900 U	1900 UJ	2000 UJ	3500 UJ	1900 UJ	2000 UJ	1900 UJ	1900 UJ	5600 U	6500 U	7400 U	7400 UJ
4,6-DINITRO-2-METHYLPHENOL	1900 U	1900 U	1900 U	1900 UJ	2000 UJ	3500 UJ	1900 UJ	2000 UJ	1900 UJ	1900 U	5600 U	6500 U	7400 U	7400 UJ
4-BROMOPHENYL PHENYL ETHER	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
4-CHLORO-3-METHYLPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
4-CHLOROANILINE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 UJ
4-METHYLPHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
4-NITROANILINE	1900 U	1900 U	1900 U	1900 UJ	2000 UJ	3500 UJ	1900 UJ	2000 UJ	1900 UJ	1900 UJ	5600 U	6500 U	7400 U	7400 UJ
4-NITROPHENOL	1900 U	1900 U	1900 U	1900 U	2000 U	3500 U	1900 U	2000 U	1900 U	1900 U	5600 U	6500 U	7400 U	7400 U
ACENAPHTHENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
ACENAPHTHYLENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
ANTHRACENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZO(A)ANTHRACENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZO(A)PYRENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZO(B)FLUORANTHENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZO(G,H,I)PERYLENE	380 UJ	390 UJ	390 UJ	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZO(K)FLUORANTHENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BENZOIC ACID	1900 U	1900 U	1900 U	1900 U	2000 U	3500 U	1900 U	2000 U	1900 U	1900 U	5600 UJ	6500 UJ	7400 UJ	7400 U
BENZYL ALCOHOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 UJ
BIS(2-CHLOROETHOXY)METHANE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BIS(2-CHLOROETHYL)ETHER	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
BIS(2-ETHYLHEXYL)PHTHALATE	49 J	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	430 J	415 J	400 J	1500 U
BUTYL BENZYL PHTHALATE	360 J	390 U	490	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
CHRYSENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
DI-N-BUTYL PHTHALATE	380 UJ	390 UJ	390 UJ	390 UJ	400 UJ	730 U	400 UJ	410 UJ	390 U	380 UJ	1200 U	1350 U	1500 U	1500 U
DI-N-OCTYL PHTHALATE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
DIBENZO(A,H)ANTHRACENE	380 UJ	390 UJ	390 UJ	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11	17-SL-11	17-SL-12
NSAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11-D	17-SL-12
SAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11A	17-SL-12
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
DIETHYL PHTHALATE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
DIMETHYL PHTHALATE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
FLUORANTHENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
FLUORENE	380 UJ	390 UJ	390 UJ	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
HEXACHLOROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
HEXACHLOROBUTADIENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
HEXACHLOROCYCLOPENTADIENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
HEXACHLOROETHANE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
INDENO(1,2,3-CD)PYRENE	380 UJ	390 UJ	390 UJ	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
ISOPHORONE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
N-NITROSODIPHENYLAMINE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
NAPHTHALENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1100 J	1400 J	1700	1500 U
NITROBENZENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
PENTACHLOROPHENOL	1900 U	1900 U	1900 U	1900 U	2000 U	3500 U	1900 U	2000 U	1900 U	1900 U	5600 U	6500 U	7400 U	7400 U
PHENANTHRENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
PHENOL	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
PYRENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
Pesticides PCBs (ug/kg)														
4,4'-DDD		19 U					19 U		19 U		93 U	93 U	93 U	
4,4'-DDE		19 U					19 U		19 U		93 U	93 U	93 U	
4,4'-DDT		19 U					19 U		19 U		93 UJ	93 UJ	93 UJ	
ALDRIN		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
ALPHA-BHC		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
ALPHA-CHLORDANE		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1016		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1221		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1232		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1242		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1248		94 U					96 U		94 U		470 U	470 U	470 U	
AROCLOR-1254		190 U					190 U		190 U		930 U	930 U	930 U	
AROCLOR-1260		190 U					190 U		190 U		930 U	930 U	930 U	
BETA-BHC		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
DELTA-BHC		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
DIELDRIN		19 U					19 U		19 U		93 U	93 U	93 U	
ENDOSULFAN I		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
ENDOSULFAN II		19 U					19 U		19 U		93 U	93 U	93 U	
ENDOSULFAN SULFATE		19 U					19 U		19 U		93 U	93 U	93 U	
ENDRIN		19 U					19 U		19 U		93 U	93 U	93 U	

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11	17-SL-11	17-SL-12
NSAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11-D	17-SL-12
SAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11A	17-SL-12
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE		19 U					19 U		19 U		93 U	93 U	93 U	
GAMMA-BHC (LINDANE)		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
GAMMA-CHLORDANE		94 U					96 U		94 U		470 U	470 U	470 U	
HEPTACHLOR		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
HEPTACHLOR EPOXIDE		9.4 U					9.6 U		9.4 U		47 U	47 U	47 U	
METHOXYCHLOR		94 U					96 U		94 U		470 UJ	470 UJ	470 UJ	
TOXAPHENE		190 U					190 U		190 U		930 U	930 U	930 U	
Inorganics (mg/kg)														
ALUMINUM	9610	5950	5970	6310	4500	7560	29700	6380	5420	29900	7190	7290	7390	5410
ANTIMONY	3.3 J	2.9 U	3.1 U	3.1 U	3 U	2.7 U	3 U	3.2 U	2.8 U	2.9 U	3 U	3 UJ	3 UJ	2.9 U
ARSENIC	1.3 J	0.72	0.53 J	0.7 J	0.29 J	0.55 J	4.6	1.6 J	0.81 J	3.1	1.5 UJ	1.55 UJ	1.6 UJ	0.84 J
BARIUM	11.8 J	9.1 J	11 J	9 J	8.5 J	11.1 J	6.8 J	3.6 J	8.3 J	12 J	24 J	17.3 J	10.6 J	26.9 J
BERYLLIUM	0.09 J	0.07 J	0.06 J	0.06 U	0.06 U	0.05 U	0.16 J	0.06 U	0.06 U	0.07 J	0.06 U	0.065 J	0.1 J	0.06 UJ
CADMIUM	1.8	1.6	1.7	0.69 U	0.76 J	6.8	0.66 U	0.7 U	1.2	0.63 U	0.67 UJ	0.665 UJ	0.66 UJ	0.65 U
CALCIUM	279 J	106 J	94.9 J	125 J	129 J	208 J	97.5 J	111 J	97 J	199 J	312 UJ	416 UJ	520 UJ	136 J
CHROMIUM	17.4	9.8	15.1	6.2	4.1	19.2	26.9	6.4	4	24.7	12 J	14.05 J	16.1 J	6
COBALT	2.4 J	2 J	2 J	1.8 J	1.5 J	1.8 J	2 J	1.1 J	1.3 J	0.85 J	2 UJ	3.35 UJ	4.7 UJ	0.37 U
COPPER	6.4 J	9.8	8.9	7.1	5.1 J	44.2	9.8	6.1 J	2.4 J	6.4 J	24.3 J	34.6 J	44.9 J	9.2
IRON	4920	3970	3120	3370	2730	3430	23800	4550	3020	12300	10100	15550	21000	2870
LEAD	6.3	54.8	18.2	11.8	7.7	70.1	6.8	4	3	4.3	156	146	136	36.1
MAGNESIUM	178 J	114 J	124 J	125 J	93.3 J	172 J	106 J	59.1 J	106 J	143 J	180 J	192.5 J	205 J	80.8 J
MANGANESE	198	34.4	17.1	28.2	19.6	31.8	13.9	5.1	32.4	18	56.1 J	86.55 J	117 J	11
MERCURY	0.08 U	0.06 U	0.08 U	0.1 U	0.1 U	0.07 U	0.1 U	0.1 U	0.07 U	0.09 U	0.08 UJ	0.1 UJ	0.12 UJ	0.04 U
NICKEL	4 J	5.2 J	2.8 J	3.8 J	3.2 J	5.7 J	4.7 J	3.2 J	3.1 J	4.6 J	8.5 J	11.6 J	14.7	2.5 U
POTASSIUM	140 U	252 J	157 J	198 J	147 U	288 J	145 U	154 U	137 U	139 U	264 J	270.5 J	277 J	185 J
SELENIUM	0.49 U	0.49 U	0.52 U	0.53 U	0.51 U	0.45 U	0.5 U	0.53 U	0.47 U	0.48 U	0.51 U	0.505 UJ	0.5 UJ	0.5 U
SILVER	0.35 U	0.35 U	0.37 U	0.38 U	0.36 U	0.32 U	0.36 U	0.38 U	0.34 U	0.34 U	0.36 U	0.36 U	0.36 U	0.35 U
SODIUM	204 J	245 J	217 J	157 J	209 J	186 J	279 J	172 J	186 J	184 J	211 UJ	201 UJ	191 UJ	157 J
THALLIUM	0.37 U	0.37 U	0.4 U	0.4 U	0.39 U	0.34 U	0.38 U	0.41 U	0.36 U	0.37 U	0.39 U	0.385 UJ	0.38 UJ	0.38 U
VANADIUM	13.7	7.9 J	8 J	8.7 J	6.4 J	9.5 J	71.3	12.8	7.6 J	37	9.2 J	9.25 J	9.3 J	8.4 J
ZINC	13.4 J	22.2	21.6	13 J	7.3	69.1	11	8.7 J	7.2 J	8.9 J	74.1 J	85.15 J	96.2 J	18.8
Miscellaneous Parameters (mg/kg)														
CYANIDE	0.26 U	0.26 U	0.28 U	0.28 U	0.26 U	0.24 U	0.27 U	0.28 U	0.25 U	0.26 U	0.27 U	0.27 U	0.27 U	0.26 U
Petroleum Hydrocarbons (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS	1.9 U	616	81.6	19	1.8 U	19300	2 U	2.5	2.3	4.2				11700

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17	17-SL-17	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21	17-SL-21	17-SL-22
NSAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17-D	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21-D	17-SL-22
SAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17A	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21A	17-SL-22
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)														
1,1,1-TRICHLOROETHANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
1,1,2,2-TETRACHLOROETHANE	29 UJ	28 UJ	6 U	6 UJ	740 UJ	735 UJ	730 UJ	6 U	3000 UJ	30 UJ	740 UJ	730 UJ	720 UJ	6 U
1,1,2-TRICHLOROETHANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
1,1-DICHLOROETHANE	29 UJ	28 UJ	6 UJ	6 UJ	740 U	735 U	730 U	6 UJ	3000 UJ	30 U	740 U	730 U	720 U	6 U
1,1-DICHLOROETHENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
1,2-DICHLOROETHANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 UJ	730 UJ	6 U	3000 UJ	30 UJ	740 U	730 U	720 U	6 U
1,2-DICHLOROPROPANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
2-BUTANONE	58 UJ	80 J	11 UJ	12 UJ	1500 UJ	1500 UJ	1500 U	12 UJ	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
2-HEXANONE	58 UJ	57 UJ	11 U	12 UJ	1500 UJ	1500 UJ	1500 UJ	12 UJ	6000 UJ	60 UJ	1500 U	1450 U	1400 U	11 U
4-METHYL-2-PENTANONE	58 UJ	57 UJ	11 U	12 UJ	1500 UJ	1500 UJ	1500 UJ	12 U	6000 UJ	60 R	1500 U	1450 U	1400 U	11 U
ACETONE	140 UJ	390 UJ	19 UJ	12 UJ	1500 UJ	1500 UJ	1500 UJ	56 UJ	6000 UJ	110 UJ	1500 UJ	1450 UJ	1400 UJ	55 UJ
BENZENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
BROMODICHLOROMETHANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
BROMOFORM	29 UJ	28 UJ	6 UJ	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
BROMOMETHANE	58 UJ	57 UJ	11 U	12 UJ	1500 U	1500 U	1500 U	12 U	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
CARBON DISULFIDE	29 UJ	26 J	6 U	5 J	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
CARBON TETRACHLORIDE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
CHLOROBENZENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
CHLORODIBROMOMETHANE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
CHLOROETHANE	58 UJ	57 UJ	11 U	12 UJ	1500 U	1500 U	1500 U	12 U	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
CHLOROFORM	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
CHLOROMETHANE	58 UJ	57 UJ	11 U	12 UJ	1500 U	1500 U	1500 U	12 U	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
CIS-1,3-DICHLOROPROPENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
ETHYLBENZENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	14000 J	6 J	1100	805 J	510 J	6 U
METHYLENE CHLORIDE	62 UJ	160 UJ	15 UJ	130 J	740 UJ	735 UJ	730 UJ	9 UJ	3000 UJ	61 UJ	740 UJ	730 UJ	720 UJ	21 UJ
STYRENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
TETRACHLOROETHENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
TOLUENE	29 UJ	38 J	6 U	6 UJ	740 U	735 U	730 U	6 U	23000 J	30 U	740 U	730 U	720 U	6 U
TOTAL 1,2-DICHLOROETHENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
TOTAL XYLENES	29 UJ	570 J	6 U	3 J	340 J	340 J	730 U	6 U	130000 J	19 J	9600	6650	3700	6 U
TRANS-1,3-DICHLOROPROPENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
TRICHLOROETHENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U	6 U
VINYL ACETATE	58 UJ	57 UJ	11 UJ	12 UJ	1500 UJ	1500 UJ	1500 UJ	12 UJ	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
VINYL CHLORIDE	58 UJ	57 UJ	11 U	12 UJ	1500 U	1500 U	1500 U	12 U	6000 UJ	60 U	1500 U	1450 U	1400 U	11 U
Semivolatile Organics (ug/kg)														
1,2,4-TRICHLOROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
1,2-DICHLOROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
1,3-DICHLOROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
1,4-DICHLOROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17	17-SL-17	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21	17-SL-21	17-SL-22
NSAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17-D	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21-D	17-SL-22
SAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17A	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21A	17-SL-22
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	5600 U	30000 U	1800 U	2000 U	1900 U	1900 U	1900 U	1900 U	9600 U	2000 U	9600 U	10300 U	11000 U	5900 U
2,4,6-TRICHLOROPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2,4-DICHLOROPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2,4-DIMETHYLPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2,4-DINITROPHENOL	5600 U	30000 UJ	1800 U	2000 U	1900 UJ	1900 UJ	1900 UJ	1900 UJ	9600 UJ	2000 UJ	9600 UJ	10300 UJ	11000 UJ	5900 UJ
2,4-DINITROTOLUENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2,6-DINITROTOLUENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2-CHLORONAPHTHALENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2-CHLOROPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2-METHYLNAPHTHALENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	4100	400 U	1500 J	1450 J	1400 J	1200 U
2-METHYLPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
2-NITROANILINE	5600 U	30000 U	1800 U	2000 U	1900 U	1900 U	1900 U	1900 U	9600 U	2000 U	9600 U	10300 U	11000 U	5900 U
2-NITROPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
3,3'-DICHLOROBENZIDINE	2300 U	12000 U	750 U	810 U	800 UJ	800 UJ	800 UJ	790 UJ	4000 UJ	810 UJ	4000 U	4300 U	4600 U	2400 UJ
3-NITROANILINE	5600 U	30000 U	1800 U	2000 U	1900 U	1900 U	1900 U	1900 UJ	9600 UJ	2000 U	9600 U	10300 U	11000 U	5900 UJ
4,6-DINITRO-2-METHYLPHENOL	5600 U	30000 U	1800 U	2000 U	1900 UJ	1900 UJ	1900 UJ	1900 U	9600 U	2000 UJ	9600 U	10300 U	11000 U	5900 UJ
4-BROMOPHENYL PHENYL ETHER	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
4-CHLORO-3-METHYLPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
4-CHLOROANILINE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 UJ
4-METHYLPHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
4-NITROANILINE	5600 UJ	30000 U	1800 U	2000 U	1900 UJ	1900 UJ	1900 UJ	1900 UJ	9600 U	2000 UJ	9600 U	10300 U	11000 U	5900 UJ
4-NITROPHENOL	5600 UJ	30000 U	1800 U	2000 U	1900 U	1900 U	1900 U	1900 U	9600 UJ	2000 U	9600 U	10300 U	11000 U	5900 U
ACENAPHTHENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
ACENAPHTHYLENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
ANTHRACENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZO(A)ANTHRACENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZO(A)PYRENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZO(B)FLUORANTHENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZO(G,H,I)PERYLENE	1200 U	6100 U	370 UJ	400 UJ	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZO(K)FLUORANTHENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BENZOIC ACID	5600 UJ	30000 UJ	1800 U	2000 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ	9600 UJ	2000 UJ	9600 UJ	10300 UJ	11000 UJ	5900 U
BENZYL ALCOHOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 UJ
BIS(2-CHLOROETHOXY)METHANE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BIS(2-CHLOROETHYL)ETHER	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
BIS(2-ETHYLHEXYL)PHTHALATE	210 J	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	750 J	160 J	450 J	450 J	2300 U	1200 U
BUTYL BENZYL PHTHALATE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
CHRYSENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
DI-N-BUTYL PHTHALATE	1200 UJ	6100 U	370 UJ	400 UJ	400 UJ	400 UJ	400 UJ	390 UJ	2000 U	400 UJ	2000 U	2150 U	2300 U	1200 UJ
DI-N-OCTYL PHTHALATE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
DIBENZO(A,H)ANTHRACENE	1200 U	6100 U	370 UJ	400 UJ	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17	17-SL-17	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21	17-SL-21	17-SL-22
NSAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17-D	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21-D	17-SL-22
SAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17A	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21A	17-SL-22
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
DIETHYL PHTHALATE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
DIMETHYL PHTHALATE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
FLUORANTHENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
FLUORENE	1200 U	6100 U	370 UJ	400 UJ	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
HEXACHLOROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
HEXACHLOROBUTADIENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
HEXACHLOROCYCLOPENTADIENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
HEXACHLOROETHANE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
INDENO(1,2,3-CD)PYRENE	1200 U	6100 U	370 UJ	400 UJ	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
ISOPHORONE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
N-NITROSO-DI-N-PROPYLAMINE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
N-NITROSODIPHENYLAMINE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
NAPHTHALENE	1200 U	7200	370 U	400 U	400 U	400 U	400 U	390 U	1500 J	81 J	620 J	570 J	520 J	1200 U
NITROBENZENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
PENTACHLOROPHENOL	5600 U	30000 U	1800 U	2000 U	1900 U	1900 U	1900 U	1900 U	9600 U	2000 U	9600 U	10300 U	11000 U	5900 U
PHENANTHRENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
PHENOL	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
PYRENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U	1200 U
Pesticides PCBs (ug/kg)														
4,4'-DDD			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
4,4'-DDE			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
4,4'-DDT			18 U		19 U	19 U	19 U				39 UJ	39 UJ	39 UJ	
ALDRIN			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
ALPHA-BHC			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
ALPHA-CHLORDANE			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1016			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1221			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1232			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1242			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1248			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
AROCLOR-1254			180 U		190 U	190 U	190 U				390 U	390 U	390 U	
AROCLOR-1260			180 U		190 U	190 U	190 U				390 U	390 U	390 U	
BETA-BHC			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
DELTA-BHC			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
DIELDRIN			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
ENDOSULFAN I			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
ENDOSULFAN II			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
ENDOSULFAN SULFATE			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
ENDRIN			18 U		19 U	19 U	19 U				39 U	39 U	39 U	

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17	17-SL-17	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21	17-SL-21	17-SL-22
NSAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17-D	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21-D	17-SL-22
SAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17A	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21A	17-SL-22
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE			18 U		19 U	19 U	19 U				39 U	39 U	39 U	
GAMMA-BHC (LINDANE)			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
GAMMA-CHLORDANE			91 U		96 U	96 U	96 U				190 U	190 U	190 U	
HEPTACHLOR			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
HEPTACHLOR EPOXIDE			9.1 U		9.6 U	9.6 U	9.6 U				19 U	19 U	19 U	
METHOXYCHLOR			91 U		96 U	96 U	96 U				190 UJ	190 UJ	190 UJ	
TOXAPHENE			180 U		190 U	190 U	190 U				390 U	390 U	390 U	
Inorganics (mg/kg)														
ALUMINUM	7340	5750	16500	8400	12000	12350	12700	11700	27900	23800	21400	23100	24800	19200
ANTIMONY	3 U	3.1 U	2.8 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	5.1 J	4.1 J	3.1 J	2.9 U
ARSENIC	1.2 J	1.1 J	3.4	1 J	1.6 J	2.2 J	2.8	1.8 J	5.9	2.2 J	2.8	2.95	3.1	3.7
BARIUM	20.7 J	11.8 J	17 J	145	9.6 J	10.9 J	12.2 J	17 J	22.6 J	49.5	91.2	129.6	168	37.9 J
BERYLLIUM	0.06 UJ	0.06 UJ	0.16 J	0.08 J	0.08 J	0.055 J	0.06 U	0.12 J	0.22 J	0.09 J	0.21 J	0.205 J	0.2 J	0.15 J
CADMIUM	1.1 J	0.68 U	0.87 J	13.9	0.66 U	0.66 U	0.66 U	0.66 U	0.65 U	8.4	22.4 J	26.5 J	30.6 J	0.64 U
CALCIUM	415 J	107 J	150 J	357 J	197 J	213 J	229 J	123 J	262 J	253 J	359 UJ	343.5 UJ	328 UJ	270 J
CHROMIUM	12.9	5.4	16.5	64.7	10.1	11.1	12.1	8.9	21.6	40	58.1 J	61.1 J	64.1 J	18.5
COBALT	1 J	0.38 U	1.3 J	0.98 J	0.86 J	0.98 J	1.1 J	1.1 J	1.4 J	1.5 J	3.6 UJ	3.15 UJ	2.7 UJ	1.8 J
COPPER	15.9	22.3	7.3	128	10.3	14.85	19.4	10	18.1	124	75.6 J	155.3 J	235 J	18.2
IRON	4640	2550	10100	4270	5900	5970	6040	5780	13500	11500	11900	11600	11300	11700
LEAD	95.4	15.7	9	207	56.9	61.75	66.6	9.7	64.7	79.9	80.8	98.9	117	31.7
MAGNESIUM	148 J	105 J	183 J	358 J	121 J	141.5 J	162 J	175 J	238 J	267 J	484 J	502 J	520 J	256 J
MANGANESE	50.4	10	26.1	63.7	18.3	20.35	22.4	20	30	42.5	93.3	105.15 J	117 J	94.4
MERCURY	0.04 U	0.04 U	0.08 U	0.09 U	0.04 U	0.04 U	0.04 U	0.07 U	0.07 U	0.04 U	0.15 UJ	0.09 UJ	0.03 U	0.04 U
NICKEL	2.6 U	2.6 U	2.4 U	2.6 U	2.6 U	2 J	2.7 J	5.2 J	3.5 J	3.2 J	8.8 J	8.8 J	8.8 J	3.1 J
POTASSIUM	384 J	197 J	248 J	248 J	397 J	400 J	403 J	196 J	875 J	460 J	805 J	810.5 J	816 J	1090 J
SELENIUM	0.51 U	0.52 U	0.48 U	0.5 U	0.5 U	0.5 U	0.5 U	0.51 U	0.5 U	0.5 U	0.51 UJ	0.515 UJ	0.52 UJ	0.49 U
SILVER	0.47 J	0.44 J	0.34 U	0.36 U	0.36 U	0.395 J	0.61 J	0.36 U	0.36 U	0.5 J	0.36 U	0.355 J	0.53 J	0.35 U
SODIUM	167 J	199 J	209 J	198 J	257 J	220 J	183 J	178 J	193 J	157 J	209 UJ	198 UJ	187 UJ	162 J
THALLIUM	0.39 U	0.39 U	0.36 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.39 U	0.395 U	0.4 U	0.37 U
VANADIUM	10 J	8.4 J	25	10.3 J	16.1	16.8	17.5	15.2	37.8	30.8	30.7	30.8	30.9	31.7
ZINC	56.4	20.7	10.2	179	13.8	18.6	23.4	11.1	21.9	73	131 J	144.5 J	158 J	25.1
Miscellaneous Parameters (mg/kg)														
CYANIDE	0.27 U	0.27 U	0.25 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.26 U	0.26 U	0.27 U	0.275 U	0.28 U	0.26 U
Petroleum Hydrocarbons (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS	9720	6790				647	647							1040

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
NSAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 UJ	6 U	6 U	6 U	6 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
2-BUTANONE	11 UJ	11 U	12 U	11 U	6 J	11 U	12 UJ	11 UJ	12 U	11 U	11 U	11 U
2-HEXANONE	11 UJ	11 U	12 U	11 U	12 UJ	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 R	11 U	12 U	11 U	12 R	11 UJ	12 UJ	11 UJ	12 U	11 U	11 U	11 U
ACETONE	36 UJ	17 UJ	41 UJ	20 UJ	32 UJ	59 UJ	12 UJ	11 UJ	34 UJ	11 UJ	11 UJ	11 UJ
BENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
BROMOFORM	6 U	6 UJ	6 UJ	6 UJ	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
BROMOMETHANE	11 U	11 U	12 U	11 U	12 U	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
CARBON DISULFIDE	6 U	6 U	1 J	6 U	6 U	6 U	2 J	5 U	6 U	2 J	2 J	3 J
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
CHLOROBENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
CHLORODIBROMOMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
CHLOROETHANE	11 U	11 U	12 U	11 U	12 U	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
CHLOROFORM	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
CHLOROMETHANE	11 U	11 UJ	12 UJ	11 UJ	12 U	11 UJ	12 UJ	11 U	12 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
METHYLENE CHLORIDE	15 UJ	13 UJ	31 UJ	19 UJ	22 UJ	26 UJ	69 J	11 UJ	32 UJ	39 UJ	25 UJ	37 UJ
STYRENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
TOLUENE	6 U	6 U	6 U	6 U	6 U	6 U	1 J	5 U	6 U	6 U	6 U	6 U
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
TOTAL XYLENES	27	6 U	6 U	6 U	6 U	6 U	2 J	1 J	3 J	5 J	5 J	2 J
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
VINYL ACETATE	11 U	11 U	12 U	11 U	12 U	11 U	12 UJ	11 UJ	12 U	11 U	11 U	11 U
VINYL CHLORIDE	11 U	11 U	12 U	11 U	12 U	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
1,2-DICHLOROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
1,3-DICHLOROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
1,4-DICHLOROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
NSAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	11000 U	23000 U	3800 U	2000 U	5800 U	48000 UJ	1900 U	1700 U	2000 U	1900 U	1800 U	1800 U
2,4,6-TRICHLOROPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2,4-DICHLOROPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2,4-DIMETHYLPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2,4-DINITROPHENOL	11000 UJ	23000 UJ	3800 UJ	2000 UJ	5800 UJ	48000 UJ	1900 U	1700 UJ	2000 UJ	1900 UJ	1800 UJ	1800 UJ
2,4-DINITROTOLUENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2,6-DINITROTOLUENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2-CHLORONAPHTHALENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2-CHLOROPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2-METHYLNAPHTHALENE	4900	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2-METHYLPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
2-NITROANILINE	11000 U	23000 U	3800 U	2000 U	5800 U	48000 UJ	1900 U	1700 U	2000 U	1900 U	1800 U	1800 U
2-NITROPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
3,3'-DICHLOROBENZIDINE	4600 UJ	9700 UJ	1600 UJ	810 UJ	2400 UJ	20000 UJ	790 U	720 UJ	840 UJ	770 UJ	740 UJ	730 UJ
3-NITROANILINE	11000 UJ	23000 UJ	3800 UJ	2000 UJ	5800 U	48000 UJ	1900 U	1700 UJ	2000 UJ	1900 UJ	1800 UJ	1800 UJ
4,6-DINITRO-2-METHYLPHENOL	11000 UJ	23000 UJ	3800 UJ	2000 UJ	5800 UJ	48000 UJ	1900 U	1700 U	2000 U	1900 U	1800 U	1800 U
4-BROMOPHENYL PHENYL ETHER	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
4-CHLORO-3-METHYLPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
4-CHLOROANILINE	2300 UJ	4800 UJ	780 UJ	400 UJ	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
4-METHYLPHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
4-NITROANILINE	11000 UJ	23000 UJ	3800 UJ	2000 UJ	5800 UJ	48000 UJ	1900 U	1700 UJ	2000 UJ	1900 UJ	1800 UJ	1800 UJ
4-NITROPHENOL	11000 U	23000 U	3800 U	2000 U	5800 U	48000 UJ	1900 U	1700 U	2000 U	1900 U	1800 U	1800 U
ACENAPHTHENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
ACENAPHTHYLENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
ANTHRACENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BENZO(A)ANTHRACENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BENZO(A)PYRENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BENZO(B)FLUORANTHENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BENZO(G,H,I)PERYLENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 UJ	360 U	420 U	380 U	370 U	360 U
BENZO(K)FLUORANTHENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BENZOIC ACID	11000 U	23000 U	3800 U	2000 U	5800 UJ	48000 UJ	1900 UJ	1700 UJ	2000 UJ	1900 UJ	1800 UJ	1800 UJ
BENZYL ALCOHOL	2300 UJ	4800 UJ	780 UJ	400 UJ	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BIS(2-CHLOROETHOXY)METHANE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BIS(2-CHLOROETHYL)ETHER	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	75 J	360 U	420 U	380 U	370 U	360 U
BUTYL BENZYL PHTHALATE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	420	360 U	420 U	380 U	370 U	360 U
CHRYSENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
DI-N-BUTYL PHTHALATE	2300 U	4800 U	780 U	400 UJ	1200 U	9900 UJ	390 UJ	360 U	420 UJ	380 U	370 U	360 U
DI-N-OCTYL PHTHALATE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
DIBENZO(A,H)ANTHRACENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 UJ	360 U	420 U	380 U	370 U	360 U

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
NSAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
DIETHYL PHTHALATE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
DIMETHYL PHTHALATE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
FLUORANTHENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
FLUORENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 UJ	360 U	420 U	380 U	370 U	360 U
HEXACHLOROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
HEXACHLOROBUTADIENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
HEXACHLOROCYCLOPENTADIENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
HEXACHLOROETHANE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
INDENO(1,2,3-CD)PYRENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 UJ	360 U	420 U	380 U	370 U	360 U
ISOPHORONE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
N-NITROSODIPHENYLAMINE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
NAPHTHALENE	1000 J	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
NITROBENZENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
PENTACHLOROPHENOL	11000 U	23000 U	3800 U	2000 U	5800 U	48000 UJ	1900 U	1700 U	2000 U	1900 U	1800 U	1800 U
PHENANTHRENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
PHENOL	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
PYRENE	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
Pesticides PCBs (ug/kg)												
4,4'-DDD			19 U									
4,4'-DDE			19 U									
4,4'-DDT			19 U									
ALDRIN			9.4 U									
ALPHA-BHC			9.4 U									
ALPHA-CHLORDANE			94 U									
AROCLOR-1016			94 U									
AROCLOR-1221			94 U									
AROCLOR-1232			94 U									
AROCLOR-1242			94 U									
AROCLOR-1248			94 U									
AROCLOR-1254			190 U									
AROCLOR-1260			190 U									
BETA-BHC			9.4 U									
DELTA-BHC			9.4 U									
DIELDRIN			19 U									
ENDOSULFAN I			9.4 U									
ENDOSULFAN II			19 U									
ENDOSULFAN SULFATE			19 U									
ENDRIN			19 U									

APPENDIX TABLE A-9-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
NSAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SAMPLE	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE			19 U									
GAMMA-BHC (LINDANE)			9.4 U									
GAMMA-CHLORDANE			94 U									
HEPTACHLOR			9.4 U									
HEPTACHLOR EPOXIDE			9.4 U									
METHOXYCHLOR			94 U									
TOXAPHENE			190 U									
Inorganics (mg/kg)												
ALUMINUM	17200	20900	17500	12700	9570	14200	14500	20000	7130	8510	26200	17700
ANTIMONY	2.9 U	3 U	3 U	2.9 U	3.1 U	3.1 U	2.9 U	2.7 U	10.3 J	2.8 U	2.8 U	2.7 U
ARSENIC	2.1 J	3.8	2.5	2.6	2.3 J	2.4 J	1.8 J	3.1	1.1 J	2 J	5	1.8 J
BARIUM	34.8 J	46.7 J	24.2 J	14.8 J	95.2	53.2	27.9 J	8.3 J	26.3 J	19.9 J	14.8 J	14.5 J
BERYLLIUM	0.06 J	0.16 J	0.08 J	0.07 J	0.12 J	0.07 J	0.17 J	0.16 J	0.08 J	0.06 U	0.21 J	0.19 J
CADMIUM	0.64 U	2.8	0.66 U	0.64 U	1.8	0.69 U	7.4	0.59 U	1.8	0.62 U	0.61 U	0.6 U
CALCIUM	333 J	518 J	339 J	780 J	196 J	210 J	532 J	151 J	280 J	340 J	439 J	411 J
CHROMIUM	18.7	30.3	16.9	13.2	15.8	16.3	82.1	15	15.7	12.6	17.9	12.4
COBALT	1.8 J	2.1 J	1.7 J	1.1 J	0.72 J	1.1 J	1.8 J	1.3 J	0.67 J	0.59 J	1.3 J	1.5 J
COPPER	218	14.1	19.8	24.5	22.9	27.1	139	5.1 J	14.5	8.7	11.9	7
IRON	7520	11200	9690	7030	4880	7710	6980	10900	3900	4930	13900	9180
LEAD	87.2	48.4	29.2	26.5	79.6	35.9	19.9	8.6	98	25.9	59.6	8.7
MAGNESIUM	378 J	461 J	187 J	159 J	128 J	167 J	302 J	97.4 J	95.1 J	123 J	194 J	140 J
MANGANESE	144	95.4	59.3	60.7	21.5	38.9	194	27.3	17.9	35.7	80.1	187
MERCURY	0.04 U	0.04 U	0.04 U	0.04 U	0.05 U	0.04 U	0.09 U	0.08 U	0.08 U	0.08 U	0.07 U	0.08 U
NICKEL	2.5 U	4.9 J	2.8 J	3.3 J	2.7 U	2.7 U	4 J	2.3 U	2.8 U	2.4 U	4.6 J	2.9 J
POTASSIUM	1350	641 J	544 J	564 J	331 J	616 J	153 J	184 J	155 U	155 J	134 U	131 U
SELENIUM	0.49 U	0.5 U	0.5 U	0.49 U	0.52 U	0.52 U	0.49 U	0.45 U	0.54 U	0.47 U	0.46 U	0.46 U
SILVER	0.35 U	0.36 U	0.53 J	0.35 U	0.37 U	0.37 U	0.35 U	0.32 U	0.38 U	0.34 U	0.33 U	0.33 U
SODIUM	181 J	167 J	163 J	193 J	271 J	277 J	179 J	186 J	206 J	133 J	136 J	151 J
THALLIUM	0.37 U	0.38 U	0.38 U	0.37 U	0.39 U	0.4 U	0.37 U	0.34 U	0.41 U	0.36 U	0.35 U	0.35 U
VANADIUM	20.1	30.9	27.4	19.3	13.8	20.4	19.6	33	10.8 J	14.1	39.4	24.8
ZINC	35.5	52.8	23.3	41.9	48.3	49.8	54.6	11.1	43	20.5	19.7	10.1
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.26 U	0.26 U	0.27 U	0.26 U	0.27 U	0.27 U	0.26 U	0.24 U	0.28 U	0.25 U	0.25 U	0.24 U
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	5540	2340	160	208	2820	5940						

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-02	17-SB-03	17-SB-04	17-SB-04	17-SB-05	17-SB-05	17-SB-05	17-SB-05	17-SB-06
NSAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7-D	17SB5-10-12	17SB6-5-7
SAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7A	17SB5-10-12	17SB6-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/19/1993	1/7/1993	1/7/1993	1/7/1993	1/19/1993	1/19/1993	1/19/1993	1/19/1993	1/7/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
1,1-DICHLOROETHENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
1,2-DICHLOROETHANE	11 UJ	12 UJ	11 U	11 U	12 U	12 U	12 U	12 U	12 UJ	13 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
2-BUTANONE	11 UJ	12 UJ	11 U	11 U	12 U	18 J	20.5 J	23 J	12 UJ	34
2-HEXANONE	11 UJ	12 UJ	11 U	11 U	12 U	12 UJ	12 UJ	12 UJ	12 UJ	13 U
4-METHYL-2-PENTANONE	11 UJ	12 UJ	11 U	11 U	12 U	12 UJ	12 UJ	12 UJ	12 UJ	4 J
ACETONE	11 J	47	54 UJ	100 UJ	97 UJ	12 UJ	12 UJ	12 UJ	19	13 U
BENZENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
BROMOFORM	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
BROMOMETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CARBON DISULFIDE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CHLOROBENZENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CHLORODIBROMOMETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CHLOROETHANE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CHLOROFORM	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
CHLOROMETHANE	11 U	12 U	11 UJ	11 UJ	12 UJ	12 U	12 U	12 U	12 U	13 UJ
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
ETHYLBENZENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
METHYLENE CHLORIDE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
STYRENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TETRACHLOROETHENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TOLUENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TOTAL 1,2-DICHLOROETHENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TOTAL XYLENES	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TRANS-1,3-DICHLOROPROPENE	11 UJ	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
TRICHLOROETHENE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
VINYL CHLORIDE	11 U	12 U	11 U	11 U	12 U	12 U	12 U	12 U	12 U	13 U
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
1,2-DICHLOROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
1,3-DICHLOROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
1,4-DICHLOROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2,4,5-TRICHLOROPHENOL	920 U	940 U	920 U	950 U	900 U	980 U	970 U	960 U	940 U	980 U

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-02	17-SB-03	17-SB-04	17-SB-04	17-SB-05	17-SB-05	17-SB-05	17-SB-05	17-SB-06
NSAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7-D	17SB5-10-12	17SB6-5-7
SAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7A	17SB5-10-12	17SB6-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/19/1993	1/7/1993	1/7/1993	1/7/1993	1/19/1993	1/19/1993	1/19/1993	1/19/1993	1/7/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2,4-DICHLOROPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2,4-DIMETHYLPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2,4-DINITROPHENOL	920 U	940 U	920 UJ	950 UJ	900 UJ	980 U	970 U	960 U	940 U	980 UJ
2,4-DINITROTOLUENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2,6-DINITROTOLUENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2-CHLORONAPHTHALENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2-CHLOROPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2-METHYLNAPHTHALENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2-METHYLPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
2-NITROANILINE	920 U	940 U	920 U	950 U	900 U	980 U	970 U	960 U	940 U	980 U
2-NITROPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
3,3'-DICHLOROBENZIDINE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
3-NITROANILINE	920 U	940 U	920 U	950 U	900 U	980 U	970 U	960 U	940 U	980 U
4,6-DINITRO-2-METHYLPHENOL	920 U	940 U	920 U	950 U	900 U	980 U	970 U	960 U	940 U	980 U
4-BROMOPHENYL PHENYL ETHER	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
4-CHLORO-3-METHYLPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
4-CHLOROANILINE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
4-METHYLPHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
4-NITROANILINE	920 U	940 U	920 UJ	950 UJ	900 UJ	980 U	970 U	960 U	940 U	980 UJ
4-NITROPHENOL	920 U	940 U	920 UJ	950 UJ	900 UJ	980 U	970 U	960 U	940 U	980 UJ
ACENAPHTHENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
ACENAPHTHYLENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
ANTHRACENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BENZO(A)ANTHRACENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BENZO(A)PYRENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BENZO(B)FLUORANTHENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BENZO(G,H,I)PERYLENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BENZO(K)FLUORANTHENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BIS(2-CHLOROETHOXY)METHANE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BIS(2-CHLOROETHYL)ETHER	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
BUTYL BENZYL PHTHALATE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
CHRYSENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
DI-N-BUTYL PHTHALATE	380 U	390 U	380 U	390 U	370 U	400 UJ	400 UJ	400 UJ	390 U	400 U
DI-N-OCTYL PHTHALATE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
DIBENZO(A,H)ANTHRACENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
DIBENZOFURAN	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
DIETHYL PHTHALATE	380 U	390 U	380 U	390 U	94 J	400 U	400 U	400 U	390 U	400 U
DIMETHYL PHTHALATE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-02	17-SB-03	17-SB-04	17-SB-04	17-SB-05	17-SB-05	17-SB-05	17-SB-05	17-SB-06
NSAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7-D	17SB5-10-12	17SB6-5-7
SAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7A	17SB5-10-12	17SB6-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/19/1993	1/7/1993	1/7/1993	1/7/1993	1/19/1993	1/19/1993	1/19/1993	1/19/1993	1/7/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
FLUORENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
HEXACHLOROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
HEXACHLOROBUTADIENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
HEXACHLOROCYCLOPENTADIENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
HEXACHLOROETHANE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
INDENO(1,2,3-CD)PYRENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
ISOPHORONE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
N-NITROSODIPHENYLAMINE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
NAPHTHALENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
NITROBENZENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
PENTACHLOROPHENOL	920 UJ	940 UJ	920 U	950 U	900 U	980 U	970 U	960 U	940 UJ	980 U
PHENANTHRENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
PHENOL	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
PYRENE	380 U	390 U	380 U	390 U	370 U	400 U	400 U	400 U	390 U	400 U
Pesticides PCBs (ug/kg)										
4,4'-DDD	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
4,4'-DDE	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	6.5 J
4,4'-DDT	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	19
ALDRIN	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
ALPHA-BHC	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
ALPHA-CHLORDANE	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
AROCLOR-1016	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
AROCLOR-1221	77 UJ	79 UJ	77 UJ	80 UJ	75 UJ	82 UJ	81.5 UJ	81 UJ	79 UJ	82 UJ
AROCLOR-1232	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
AROCLOR-1242	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
AROCLOR-1248	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
AROCLOR-1254	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
AROCLOR-1260	38 UJ	39 UJ	38 UJ	39 UJ	37 UJ	40 UJ	40 UJ	40 UJ	39 UJ	40 UJ
BETA-BHC	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
DELTA-BHC	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
DIELDRIN	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
ENDOSULFAN I	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
ENDOSULFAN II	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
ENDOSULFAN SULFATE	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
ENDRIN	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
ENDRIN KETONE	3.8 UJ	3.9 UJ	3.8 UJ	3.9 UJ	3.7 UJ	4 UJ	4 UJ	4 UJ	3.9 UJ	4 UJ
GAMMA-BHC (LINDANE)	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
GAMMA-CHLORDANE	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-02	17-SB-03	17-SB-04	17-SB-04	17-SB-05	17-SB-05	17-SB-05	17-SB-05	17-SB-06
NSAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7-D	17SB5-10-12	17SB6-5-7
SAMPLE	17SB1-5-7	17SB2-5-7	17SB3-10-12	17SB4-5-7	17SB4-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7A	17SB5-10-12	17SB6-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/19/1993	1/7/1993	1/7/1993	1/7/1993	1/19/1993	1/19/1993	1/19/1993	1/19/1993	1/7/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
HEPTACHLOR EPOXIDE	2 UJ	2 UJ	2 UJ	2 UJ	1.9 UJ	2.1 UJ	2.05 UJ	2 UJ	2 UJ	2.1 UJ
METHOXYCHLOR	20 UJ	20 UJ	20 UJ	20 UJ	19 UJ	21 UJ	20.5 UJ	20 UJ	20 UJ	21 UJ
TOXAPHENE	200 UJ	200 UJ	200 UJ	200 UJ	190 UJ	210 UJ	205 UJ	200 UJ	200 UJ	210 UJ
Inorganics (mg/kg)										
ALUMINUM	33200	55200	5800	10000	4550	3940 J	12520 J	21100 J	7650	9250
ANTIMONY	5.6 U	5.8 U	2.8 U	2.9 U	2.7 U	5.9 R	5.9 R	5.9 R	5.8 U	3 U
ARSENIC	8	2.2 J	2.1 J	0.5 J	1.3 J	2.1 J	2.7 J	3.3	2.2 J	0.71 J
BARIUM	14.3 J	10 J	2.4 J	4.8 J	2.5 J	5.3 J	6.8 J	8.3 J	3.8 J	3.9 J
BERYLLIUM	0.28 J	0.45 J	0.11 U	0.12 U	0.11 U	0.27 UJ	0.32 UJ	0.37 UJ	0.13 J	0.12 U
CADMIUM	0.89 U	0.93 U	0.28 U	0.75 J	0.27 U	0.95 UJ	0.95 UJ	0.95 UJ	0.93 U	2.5
CALCIUM	87.9 J	85.9 J	79.7 J	156 J	80.8 J	24.1 UJ	27.95 UJ	31.8 UJ	159 J	147 J
CHROMIUM	27.9	45.4	9.3	26.3	10.3	23.7 J	29.4 J	35.1 J	10.6	50.5
COBALT	0.83 J	0.57 J	1.3 U	1.4 U	1.3 U	0.54 UJ	0.635 J	1 J	0.53 U	1.6 J
COPPER	6.7	9.9	2.6 J	6.3	3.2 J	4.3 J	6.1 J	7.9 J	7.8	22.7
IRON	22300	39100	10400	29300	11900	25500	34450	43400	12400	89800
LEAD	44.7	7.8	2.9	2.6	2.8	4.4 J	5.6 J	6.8 J	3.5	8.3
MAGNESIUM	177 J	186 J	33.6 J	84.8 J	37.6 J	22.4 UJ	43.45 UJ	64.5 UJ	111 J	45.5 J
MANGANESE	40.6	32.4	12.4	27.9	13.1	15.6	22.8	30	42.6	226
MERCURY	0.02 U	0.03 J	0.03 U	0.03 U	0.03 J	0.03 J	0.025 J	0.02 J	0.02 U	0.04 J
NICKEL	4.1 J	4.2 J	1.8 U	1.8 U	1.7 U	3 UJ	3 UJ	3 UJ	2.9 U	3.1 J
POTASSIUM	1180	121 U	96.9 J	53.6 J	42.7 U	222 J	283.5 J	345 J	121 U	437 J
SELENIUM	4	2.3	0.11 U	0.12 U	0.11 U	0.59 J	0.73 J	0.87 J	1.1 J	0.12 U
SILVER	0.71 J	1.3 J	0.48 U	0.5 U	0.47 U	0.86 J	1.38 J	1.9 J	0.78 J	1.3 J
SODIUM	19.9 J	49.7 J	184 J	207 J	204 J	30.2 J	30.2 J	33.4 UJ	13.1 U	185 J
THALLIUM	5.7 U	6 U	0.16 U	0.17 U	0.16 U	0.61 R	3.355 R	6.1 R	0.6 U	0.17 U
VANADIUM	57.6	100	27.7	74	31.2	68 J	79.9 J	91.8 J	37.8	105
ZINC	6.8	5.8	4.3 J	8.9	4.8	2.9 UJ	3.375 J	5.3 J	1.9 J	18.9
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.51 J	0.51 J	0.17 U	0.18 U	0.17 U	0.62 UJ	0.61 UJ	0.6 UJ	0.51 J	0.18 U

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-06	17-SB-07	17-SB-08	17-SB-08	17-SB-09	17-SB-09	17-SB-02
NSAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1993	1/18/1993	1/18/1993	1/18/1993	1/6/1993	1/6/1993	1/19/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 UJ
1,2-DICHLOROPROPANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
2-BUTANONE	11 U	12 U	12 U	11 U	12 U	12 U	11 UJ
2-HEXANONE	11 U	12 U	12 U	11 U	12 U	12 U	11 UJ
4-METHYL-2-PENTANONE	11 U	12 U	12 U	11 U	12 U	12 U	11 UJ
ACETONE	62 UJ	26 J	82 J	11 J	120 UJ	130 J	18
BENZENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
BROMOFORM	11 U	12 U	12 U	11 U	12 U	12 U	11 U
BROMOMETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CARBON DISULFIDE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CHLOROBENZENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CHLOROETHANE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CHLOROFORM	11 U	12 U	12 U	11 U	12 U	12 U	11 U
CHLOROMETHANE	11 UJ	12 U	12 U	11 U	12 UJ	12 UJ	11 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
ETHYLBENZENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
METHYLENE CHLORIDE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
STYRENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TETRACHLOROETHENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TOLUENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TOTAL XYLENES	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
TRICHLOROETHENE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
VINYL CHLORIDE	11 U	12 U	12 U	11 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
1,2-DICHLOROBENZENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
1,3-DICHLOROBENZENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
1,4-DICHLOROBENZENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2,4,5-TRICHLOROPHENOL	850 U	940 U	980 U	880 U	940 U	930 U	890 U

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-06	17-SB-07	17-SB-08	17-SB-08	17-SB-09	17-SB-09	17-SB-02
NSAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1993	1/18/1993	1/18/1993	1/18/1993	1/6/1993	1/6/1993	1/19/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2,4-DICHLOROPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2,4-DIMETHYLPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2,4-DINITROPHENOL	850 UJ	940 U	980 U	880 U	940 U	930 U	890 U
2,4-DINITROTOLUENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2,6-DINITROTOLUENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2-CHLORONAPHTHALENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2-CHLOROPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2-METHYLNAPHTHALENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2-METHYLPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
2-NITROANILINE	850 U	940 U	980 U	880 U	940 U	930 U	890 U
2-NITROPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
3,3'-DICHLOROBENZIDINE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
3-NITROANILINE	850 U	940 U	980 U	880 U	940 U	930 U	890 U
4,6-DINITRO-2-METHYLPHENOL	850 U	940 U	980 U	880 U	940 U	930 U	890 U
4-BROMOPHENYL PHENYL ETHER	350 U	390 U	400 U	360 U	390 U	380 U	370 U
4-CHLORO-3-METHYLPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
4-CHLOROANILINE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
4-METHYLPHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
4-NITROANILINE	850 UJ	940 U	980 U	880 U	940 U	930 U	890 U
4-NITROPHENOL	850 UJ	940 U	980 U	880 U	940 U	930 U	890 U
ACENAPHTHENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
ACENAPHTHYLENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
ANTHRACENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BENZO(A)ANTHRACENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BENZO(A)PYRENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BENZO(B)FLUORANTHENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BENZO(G,H,I)PERYLENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BENZO(K)FLUORANTHENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BIS(2-CHLOROETHOXY)METHANE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BIS(2-CHLOROETHYL)ETHER	350 U	390 U	400 U	360 U	390 U	380 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	350 U	390 U	400 U	360 U	390 UJ	380 U	370 U
BUTYL BENZYL PHTHALATE	350 U	390 U	400 U	360 U	390 UJ	380 U	370 U
CHRYSENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
DI-N-BUTYL PHTHALATE	350 U	390 UJ	400 UJ	310	390 U	380 U	370 U
DI-N-OCTYL PHTHALATE	350 U	390 U	400 U	360 U	390 UJ	380 U	370 U
DIBENZO(A,H)ANTHRACENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
DIBENZOFURAN	350 U	390 U	400 U	360 U	390 U	380 U	370 U
DIETHYL PHTHALATE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
DIMETHYL PHTHALATE	350 U	390 U	400 U	360 U	390 U	380 U	370 U

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-06	17-SB-07	17-SB-08	17-SB-08	17-SB-09	17-SB-09	17-SB-02
NSAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1993	1/18/1993	1/18/1993	1/18/1993	1/6/1993	1/6/1993	1/19/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
FLUORENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
HEXACHLOROBENZENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
HEXACHLOROBUTADIENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
HEXACHLOROCYCLOPENTADIENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
HEXACHLOROETHANE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
INDENO(1,2,3-CD)PYRENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
ISOPHORONE	350 U	390 U	400 U	360 U	390 UJ	380 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
N-NITROSODIPHENYLAMINE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
NAPHTHALENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
NITROBENZENE	350 U	390 U	400 U	360 U	390 UJ	380 U	370 U
PENTACHLOROPHENOL	850 U	940 U	980 U	880 U	940 U	930 U	890 UJ
PHENANTHRENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
PHENOL	350 U	390 U	400 U	360 U	390 U	380 U	370 U
PYRENE	350 U	390 U	400 U	360 U	390 U	380 U	370 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
4,4'-DDE	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
4,4'-DDT	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
ALDRIN	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
ALPHA-BHC	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
ALPHA-CHLORDANE	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
AROCLOR-1016	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
AROCLOR-1221	72 UJ	79 UJ	81 U	74 UJ	79 UJ	78 UJ	74 UJ
AROCLOR-1232	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
AROCLOR-1242	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
AROCLOR-1248	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
AROCLOR-1254	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
AROCLOR-1260	35 UJ	39 UJ	40 U	36 UJ	39 UJ	38 UJ	37 UJ
BETA-BHC	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
DELTA-BHC	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
DIELDRIN	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
ENDOSULFAN I	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
ENDOSULFAN II	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
ENDOSULFAN SULFATE	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
ENDRIN	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
ENDRIN KETONE	3.5 UJ	3.9 UJ	4 U	3.6 UJ	3.9 UJ	3.8 UJ	3.7 UJ
GAMMA-BHC (LINDANE)	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
GAMMA-CHLORDANE	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ

APPENDIX TABLE A-9-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2 - 15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-06	17-SB-07	17-SB-08	17-SB-08	17-SB-09	17-SB-09	17-SB-02
NSAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SAMPLE	17SB6-10-12	17SB7-5-7	17SB8-5-7	17SB8-10-12	17SB9-5-7	17SB9-10-12	17SB2-10-12
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	10 - 12	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/7/1993	1/18/1993	1/18/1993	1/18/1993	1/6/1993	1/6/1993	1/19/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
HEPTACHLOR EPOXIDE	1.8 UJ	2 UJ	2 U	1.9 UJ	2 UJ	2 UJ	1.9 UJ
METHOXYCHLOR	18 UJ	20 UJ	20 U	19 UJ	20 UJ	20 UJ	19 UJ
TOXAPHENE	180 UJ	200 UJ	200 U	190 UJ	200 UJ	200 UJ	190 UJ
Inorganics (mg/kg)							
ALUMINUM	3730	45000	53300	19000	7800	6220	26000
ANTIMONY	2.6 U	8 J	6 U	5.4 U	7 J	5.8 U	5.5 U
ARSENIC	0.68 J	2.4 J	6.4	3.1 J	3	1.8 J	6.2
BARIUM	1.5 J	7.2 J	10.5 J	3.8 J	3 J	3.6 J	4.1 J
BERYLLIUM	0.11 U	0.07 U	0.07 U	0.06 U	0.06 U	0.06 U	0.21 J
CADMIUM	0.26 U	0.99 U	0.95 U	0.87 U	0.93 U	0.92 U	0.88 U
CALCIUM	64.9 J	16.9 J	7.9 U	7.2 U	7.7 U	7.7 U	21.8 J
CHROMIUM	4.8	45.8	46.1	12.8	24.3	19.9	18.8
COBALT	1.2 U	4.2 J	4.4 J	0.64 J	2.1 J	0.92 J	0.5 U
COPPER	3.7 J	1.4 J	5.4 J	2.3 J	0.39 U	0.39 U	5 J
IRON	6240	50700	48400	10500	31600	22200	17800
LEAD	0.92	6.9	8.5	2.7	8	5.4	5.2
MAGNESIUM	18.3 J	115 J	187 J	64.7 J	30.7 J	27.1 J	79.9 J
MANGANESE	78.2	76.9	41.5	28.7	24.4	15	20.1
MERCURY	0.03 U	0.02 U	0.02 U	0.02 U	0.02 J	0.03 J	0.02 U
NICKEL	1.6 U	3.1 J	6.9 J	3.9 J	2.9 U	2.9 U	2.8 U
POTASSIUM	40.9 U	319 J	736 J	112 U	121 U	120 U	114 U
SELENIUM	0.11 U	0.64 J	3.4	0.61 J	0.65 J	0.5 U	4.5
SILVER	0.45 U	1 J	1.4 J	0.53 U	1.2 J	0.81 J	0.69 J
SODIUM	168 J	13.9 U	16.4 J	12.2 U	13.1 U	13 U	23.5 J
THALLIUM	0.15 U	6.4 U	6.1 U	0.56 U	6 U	5.9 U	5.7 U
VANADIUM	15.7	99.3	95.7	27.8	82	60.5	47.3
ZINC	2.9 J	1.6 J	3.3 J	1.7 J	0.37 U	0.37 U	3.2 J
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.16 U	0.66 J	0.45 J	0.46 J	0.53 J	0.48 J	0.52 J

APPENDIX TABLE A-9-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-01	17-SB-05	17-SB-07
NSAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SUBMATRIX	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	60 - 62	20 - 22	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/7/1993	1/19/1993	1/18/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)				
1,1,1-TRICHLOROETHANE	11 U		10 U	15 U
1,1,2,2-TETRACHLOROETHANE	11 U		10 U	15 U
1,1,2-TRICHLOROETHANE	11 U		10 U	15 U
1,1-DICHLOROETHANE	11 U		10 U	15 U
1,1-DICHLOROETHENE	11 U		10 U	15 U
1,2-DICHLOROETHANE	11 UJ		10 UJ	15 U
1,2-DICHLOROPROPANE	11 U		10 U	15 U
2-BUTANONE	11 UJ		10 UJ	15 U
2-HEXANONE	11 UJ		10 UJ	15 U
4-METHYL-2-PENTANONE	11 UJ		10 UJ	15 U
ACETONE	29 J		10 UJ	14 J
BENZENE	11 U		10 U	15 U
BROMODICHLOROMETHANE	11 U		10 U	15 U
BROMOFORM	11 U		10 U	15 U
BROMOMETHANE	11 U		10 U	15 U
CARBON DISULFIDE	11 U		10 U	15 U
CARBON TETRACHLORIDE	11 U		10 U	15 U
CHLOROBENZENE	11 U		10 U	15 U
CHLORODIBROMOMETHANE	11 U		10 U	15 U
CHLOROETHANE	11 U		10 U	15 U
CHLOROFORM	11 U		10 U	15 U
CHLOROMETHANE	11 U		10 U	15 U
CIS-1,3-DICHLOROPROPENE	11 U		10 U	15 U
ETHYLBENZENE	11 U		10 U	15 U
METHYLENE CHLORIDE	11 U		10 U	15 U
STYRENE	11 U		10 U	15 U
TETRACHLOROETHENE	11 U		10 U	15 U
TOLUENE	11 U		10 U	15 U
TOTAL 1,2-DICHLOROETHENE	11 U		10 U	15 U
TOTAL XYLENES	11 U		10 U	15 U
TRANS-1,3-DICHLOROPROPENE	11 UJ		10 UJ	15 U
TRICHLOROETHENE	11 U		10 U	15 U
VINYL CHLORIDE	11 U		10 U	15 U
Semivolatile Organics (ug/kg)				
1,2,4-TRICHLOROBENZENE	360 U		340 U	350 U
1,2-DICHLOROBENZENE	360 U		340 U	350 U
1,3-DICHLOROBENZENE	360 U		340 U	350 U
1,4-DICHLOROBENZENE	360 U		340 U	350 U
2,4,5-TRICHLOROPHENOL	880 U		820 U	840 U

APPENDIX TABLE A-9-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-01	17-SB-05	17-SB-07
NSAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SUBMATRIX	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	60 - 62	20 - 22	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/7/1993	1/19/1993	1/18/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	360 U		340 U	350 U
2,4-DICHLOROPHENOL	360 U		340 U	350 U
2,4-DIMETHYLPHENOL	360 U		340 U	350 U
2,4-DINITROPHENOL	880 U		820 U	840 U
2,4-DINITROTOLUENE	360 U		340 U	350 U
2,6-DINITROTOLUENE	360 U		340 U	350 U
2-CHLORONAPHTHALENE	360 U		340 U	350 U
2-CHLOROPHENOL	360 U		340 U	350 U
2-METHYLNAPHTHALENE	360 U		340 U	350 U
2-METHYLPHENOL	360 U		340 U	350 U
2-NITROANILINE	880 U		820 U	840 U
2-NITROPHENOL	360 U		340 U	350 U
3,3'-DICHLOROBENZIDINE	360 U		340 U	350 U
3-NITROANILINE	880 U		820 U	840 U
4,6-DINITRO-2-METHYLPHENOL	880 U		820 U	840 U
4-BROMOPHENYL PHENYL ETHER	360 U		340 U	350 U
4-CHLORO-3-METHYLPHENOL	360 U		340 U	350 U
4-CHLOROANILINE	360 U		340 U	350 U
4-METHYLPHENOL	360 U		340 U	350 U
4-NITROANILINE	880 U		820 U	840 U
4-NITROPHENOL	880 U		820 U	840 U
ACENAPHTHENE	360 U		340 U	350 U
ACENAPHTHYLENE	360 U		340 U	350 U
ANTHRACENE	360 U		340 U	350 U
BENZO(A)ANTHRACENE	360 U		340 U	350 U
BENZO(A)PYRENE	360 U		340 U	350 U
BENZO(B)FLUORANTHENE	360 U		340 U	350 U
BENZO(G,H,I)PERYLENE	360 U		340 U	350 U
BENZO(K)FLUORANTHENE	360 U		340 U	350 U
BIS(2-CHLOROETHOXY)METHANE	360 U		340 U	350 U
BIS(2-CHLOROETHYL)ETHER	360 U		340 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U		340 U	350 U
BUTYL BENZYL PHTHALATE	360 U		340 U	350 U
CHRYSENE	360 U		340 U	350 U
DI-N-BUTYL PHTHALATE	360 U		340 U	350 UJ
DI-N-OCTYL PHTHALATE	360 U		340 U	350 U
DIBENZO(A,H)ANTHRACENE	360 U		340 U	350 U
DIBENZOFURAN	360 U		340 U	350 U
DIETHYL PHTHALATE	360 U		340 U	350 U
DIMETHYL PHTHALATE	360 U		340 U	350 U

APPENDIX TABLE A-9-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-01	17-SB-05	17-SB-07
NSAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SUBMATRIX	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	60 - 62	20 - 22	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/7/1993	1/19/1993	1/18/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	360 U		340 U	350 U
FLUORENE	360 U		340 U	350 U
HEXACHLOROBENZENE	360 U		340 U	350 U
HEXACHLOROBUTADIENE	360 U		340 U	350 U
HEXACHLOROCYCLOPENTADIENE	360 U		340 U	350 U
HEXACHLOROETHANE	360 U		340 U	350 U
INDENO(1,2,3-CD)PYRENE	360 U		340 U	350 U
ISOPHORONE	360 U		340 U	350 U
N-NITROSO-DI-N-PROPYLAMINE	360 U		340 U	350 U
N-NITROSODIPHENYLAMINE	360 U		340 U	350 U
NAPHTHALENE	360 U		340 U	350 U
NITROBENZENE	360 U		340 U	350 U
PENTACHLOROPHENOL	880 UJ		820 UJ	840 U
PHENANTHRENE	360 U		340 U	350 U
PHENOL	360 U		340 U	350 U
PYRENE	360 U		340 U	350 U
Pesticides PCBs (ug/kg)				
4,4'-DDD	3.6 UJ		3.4 UJ	3.5 UJ
4,4'-DDE	3.6 UJ		3.4 UJ	3.5 UJ
4,4'-DDT	3.6 UJ		3.4 UJ	3.5 UJ
ALDRIN	1.9 UJ		1.7 UJ	1.8 UJ
ALPHA-BHC	1.9 UJ		1.7 UJ	1.8 UJ
ALPHA-CHLORDANE	1.9 UJ		1.7 UJ	1.8 UJ
AROCLOR-1016	36 UJ		34 UJ	35 UJ
AROCLOR-1221	74 UJ		68 UJ	71 UJ
AROCLOR-1232	36 UJ		34 UJ	35 UJ
AROCLOR-1242	36 UJ		34 UJ	35 UJ
AROCLOR-1248	36 UJ		34 UJ	35 UJ
AROCLOR-1254	36 UJ		34 UJ	35 UJ
AROCLOR-1260	36 UJ		34 UJ	35 UJ
BETA-BHC	1.9 UJ		1.7 UJ	1.8 UJ
DELTA-BHC	1.9 UJ		1.7 UJ	1.8 UJ
DIELDRIN	3.6 UJ		3.4 UJ	3.5 UJ
ENDOSULFAN I	1.9 UJ		1.7 UJ	1.8 UJ
ENDOSULFAN II	3.6 UJ		3.4 UJ	3.5 UJ
ENDOSULFAN SULFATE	3.6 UJ		3.4 UJ	3.5 UJ
ENDRIN	3.6 UJ		3.4 UJ	3.5 UJ
ENDRIN KETONE	3.6 UJ		3.4 UJ	3.5 UJ
GAMMA-BHC (LINDANE)	1.9 UJ		1.7 UJ	1.8 UJ
GAMMA-CHLORDANE	1.9 UJ		1.7 UJ	1.8 UJ

APPENDIX TABLE A-9-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-01	17-SB-05	17-SB-07
NSAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SUBMATRIX	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	60 - 62	20 - 22	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/7/1993	1/19/1993	1/18/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.9 UJ		1.7 UJ	1.8 UJ
HEPTACHLOR EPOXIDE	1.9 UJ		1.7 UJ	1.8 UJ
METHOXYCHLOR	19 UJ		17 UJ	18 UJ
TOXAPHENE	190 UJ		170 UJ	180 UJ
Inorganics (mg/kg)				
ALUMINUM	24600	347	1180	1540
ANTIMONY	5.4 U	2.6 U	5 U	5.1 U
ARSENIC	5.5	0.15 U	0.43 J	1.1 J
BARIUM	5.8 J	0.51 J	0.32 J	0.1 UJ
BERYLLIUM	0.15 J	0.11 U	0.06 U	0.06 U
CADMIUM	0.87 U	0.26 U	0.81 U	0.82 U
CALCIUM	41.3 J	70.3 J	7.6 J	14.2 J
CHROMIUM	15.9	2.1 J	1.2 J	2.3
COBALT	0.49 U	0.12 U	0.46 U	0.47 U
COPPER	4.3 J	1.2 J	0.34 U	1.1 J
IRON	13200	457	742	1330
LEAD	3.4	0.3 J	0.18 J	0.8 J
MAGNESIUM	96.4 J	14.3 J	7.3 U	9.4 J
MANGANESE	15.1	2.4 J	1.5 J	7
MERCURY	0.02 U	0.04 J	0.02 U	0.02 U
NICKEL	2.8 J	1.7 U	2.5 U	2.6 U
POTASSIUM	113 U	41.1 U	105 U	106 U
SELENIUM	1.5	0.11 U	0.44 U	0.91 J
SILVER	0.53 U	0.45 U	0.49 U	0.5 UJ
SODIUM	12.2 U	169 J	11.4 U	11.5 U
THALLIUM	5.6 U	0.15 U	0.52 U	5.3 U
VANADIUM	36.4	1.6 J	1.6 J	3.1 J
ZINC	3.3 J	3.8 J	0.52 J	0.81 J
Miscellaneous Parameters (mg/kg)				
CYANIDE	0.52 J	0.16 U	0.46 J	0.43 J

APPENDIX TABLE A-9-4
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL TCLP ANALYSES
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-02	17-SL-07	17-SL-09	17-SL-11	17-SL-15	17-SL-17	17-SL-21	17-SL-25
NSAMPLE	17-SL-02TCLP	17-SL-07TCLP	17-SL-09TCLP	17-SL-11TCLP	17-SL-15TCLP	17-SL-17TCLP	17-SL-21TCLP	17-SL-25TCLP
SAMPLE	17-SL-02TCLP	17-SL-07TCLP	17-SL-09TCLP	17-SL-11TCLP	17-SL-15TCLP	17-SL-17TCLP	17-SL-21TCLP	17-SL-25TCLP
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
TCLP Volatile Organics (ug/L)								
1,1-DICHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
1,2-DICHLOROETHANE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-BUTANONE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
BENZENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CARBON TETRACHLORIDE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CHLOROBENZENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CHLOROFORM	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
TETRACHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
TRICHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
VINYL CHLORIDE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
TCLP Metals (ug/L)								
ARSENIC	25.3 U	25.3 U	25.3 U	25.3 UJ	25.3 U	25.3 U	25.3 UJ	25.3 U
BARIUM	740	724	618	980	966	1130	1350	1100
CADMIUM	27.7	2.7 U	2.7 U	5.6	3.6 J	12.3	136	14.9
CHROMIUM	1.9 U	2.3 J	1.9 U	2.4 J	1.9 U	2.7 J	3.1 J	3.1 J
LEAD	430	11.8 U	11.8 U	1780	11.8 U	366	488	79.3
MERCURY	0.16 U	0.16 U	0.16 U	0.12 UJ	0.16 U	0.19 J	0.39 UJ	0.14 J
SELENIUM	31.3 U	31.3 U	31.3 U	31.3 U	31.3 U	31.3 U	31.3 U	31.3 U
SILVER	1.5 UJ	1.5 U	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U

APPENDIX TABLE A-9-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11	17-SL-11	17-SL-12
NSAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11-D	17-SL-12
SAMPLE	17-SL-01	17-SL-02	17-SL-03	17-SL-04	17-SL-05	17-SL-06	17-SL-07	17-SL-08	17-SL-09	17-SL-10	17-SL-11	17-SL-11-AVG	17-SL-11A	17-SL-12
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)														
2-BUTANONE	12 UJ	1500 U	12 U	12 U	12 U	11 U	13 U	12 U	12 U	12 U	1500 U	8250 U	15000 U	55
CARBON DISULFIDE	2 J	730 U	6 U	1 J	6 U	11	1 J	1 J	1 J	6 U	730 U	4015 U	7300 U	2 J
ETHYLBENZENE	6 U	730 U	6 U	6 U	6 U	3 J	7 U	6 U	6 U	6 U	5000	8500	12000	2 J
METHYLENE CHLORIDE	51 UJ	730 UJ	8 UJ	7 UJ	12 UJ	96 UJ	9 UJ	61 UJ	33 UJ	34 UJ	730 UJ	4015 UJ	7300 UJ	48 UJ
TOLUENE	6 U	730 U	6 U	6 U	6 U	2 J	7 U	6 U	6 U	6 U	730 U	4015 U	7300 U	7 U
TOTAL XYLENES	5 J	730 U	6 U	6 U	6 U	11	7 U	4 J	4 J	3 J	30000	57000	84000	38
TRICHLOROETHENE	6 U	160 J	6 U	6 U	6 U	5 U	7 U	2 J	6 U	6 U	730 U	4015 U	7300 U	7 U
Semivolatile Organics (ug/kg)														
2-METHYLNAPHTHALENE	380 U	390 U	390 U	390 U	400 U	190 J	400 U	410 U	390 U	380 U	1400	2250	3100	1500 U
BIS(2-ETHYLHEXYL)PHTHALATE	49 J	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	430 J	415 J	400 J	1500 U
BUTYL BENZYL PHTHALATE	360 J	390 U	490	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1200 U	1350 U	1500 U	1500 U
NAPHTHALENE	380 U	390 U	390 U	390 U	400 U	730 U	400 U	410 U	390 U	380 U	1100 J	1400 J	1700	1500 U
Inorganics (mg/kg)														
ALUMINUM	9610	5950	5970	6310	4500	7560	29700	6380	5420	29900	7190	7290	7390	5410
ANTIMONY	3.3 J	2.9 U	3.1 U	3.1 U	3 U	2.7 U	3 U	3.2 U	2.8 U	2.9 U	3 U	3 UJ	3 UJ	2.9 U
ARSENIC	1.3 J	0.72	0.53 J	0.7 J	0.29 J	0.55 J	4.6	1.6 J	0.81 J	3.1	1.5 UJ	1.55 UJ	1.6 UJ	0.84 J
BARIUM	11.8 J	9.1 J	11 J	9 J	8.5 J	11.1 J	6.8 J	3.6 J	8.3 J	12 J	24 J	17.3 J	10.6 J	26.9 J
BERYLLIUM	0.09 J	0.07 J	0.06 J	0.06 U	0.06 U	0.05 U	0.16 J	0.06 U	0.06 U	0.07 J	0.06 U	0.065 J	0.1 J	0.06 UJ
CADMIUM	1.8	1.6	1.7	0.69 U	0.76 J	6.8	0.66 U	0.7 U	1.2	0.63 U	0.67 UJ	0.665 UJ	0.66 UJ	0.65 U
CALCIUM	279 J	106 J	94.9 J	125 J	129 J	208 J	97.5 J	111 J	97 J	199 J	312 UJ	416 UJ	520 UJ	136 J
CHROMIUM	17.4	9.8	15.1	6.2	4.1	19.2	26.9	6.4	4	24.7	12 J	14.05 J	16.1 J	6
COBALT	2.4 J	2 J	2 J	1.8 J	1.5 J	1.8 J	2 J	1.1 J	1.3 J	0.85 J	2 UJ	3.35 UJ	4.7 UJ	0.37 U
COPPER	6.4 J	9.8	8.9	7.1	5.1 J	44.2	9.8	6.1 J	2.4 J	6.4 J	24.3 J	34.6 J	44.9 J	9.2
IRON	4920	3970	3120	3370	2730	3430	23800	4550	3020	12300	10100	15550	21000	2870
LEAD	6.3	54.8	18.2	11.8	7.7	70.1	6.8	4	3	4.3	156	146	136	36.1
MAGNESIUM	178 J	114 J	124 J	125 J	93.3 J	172 J	106 J	59.1 J	106 J	143 J	180 J	192.5 J	205 J	80.8 J
MANGANESE	198	34.4	17.1	28.2	19.6	31.8	13.9	5.1	32.4	18	56.1 J	86.55 J	117 J	11
NICKEL	4 J	5.2 J	2.8 J	3.8 J	3.2 J	5.7 J	4.7 J	3.2 J	3.1 J	4.6 J	8.5 J	11.6 J	14.7	2.5 U
POTASSIUM	140 U	252 J	157 J	198 J	147 U	288 J	145 U	154 U	137 U	139 U	264 J	270.5 J	277 J	185 J
SILVER	0.35 U	0.35 U	0.37 U	0.38 U	0.36 U	0.32 U	0.36 U	0.38 U	0.34 U	0.34 U	0.36 U	0.36 U	0.36 U	0.35 U
SODIUM	204 J	245 J	217 J	157 J	209 J	186 J	279 J	172 J	186 J	184 J	211 UJ	201 UJ	191 UJ	157 J
VANADIUM	13.7	7.9 J	8 J	8.7 J	6.4 J	9.5 J	71.3	12.8	7.6 J	37	9.2 J	9.25 J	9.3 J	8.4 J
ZINC	13.4 J	22.2	21.6	13 J	7.3	69.1	11	8.7 J	7.2 J	8.9 J	74.1 J	85.15 J	96.2 J	18.8
Petroleum Hydrocarbon (mg/kg)														
TOTAL PETROLEUM HYDROCARBONS	1.9 U	616	81.6	19	1.8 U	19300	2 U	2.5	2.3	4.2				11700

APPENDIX TABLE A-9-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17	17-SL-17	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21	17-SL-21
NSAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17-D	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21-D
SAMPLE	17-SL-13	17-SL-14	17-SL-15	17-SL-16	17-SL-17	17-SL-17-AVG	17-SL-17A	17-SL-18	17-SL-19	17-SL-20	17-SL-21	17-SL-21-AVG	17-SL-21A
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)													
2-BUTANONE	58 UJ	80 J	11 UJ	12 UJ	1500 UJ	1500 UJ	1500 U	12 UJ	6000 UJ	60 U	1500 U	1450 U	1400 U
CARBON DISULFIDE	29 UJ	26 J	6 U	5 J	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U
ETHYLBENZENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	14000 J	6 J	1100	805 J	510 J
METHYLENE CHLORIDE	62 UJ	160 UJ	15 UJ	130 J	740 UJ	735 UJ	730 UJ	9 UJ	3000 UJ	61 UJ	740 UJ	730 UJ	720 UJ
TOLUENE	29 UJ	38 J	6 U	6 UJ	740 U	735 U	730 U	6 U	23000 J	30 U	740 U	730 U	720 U
TOTAL XYLENES	29 UJ	570 J	6 U	3 J	340 J	340 J	730 U	6 U	130000 J	19 J	9600	6650	3700
TRICHLOROETHENE	29 UJ	28 UJ	6 U	6 UJ	740 U	735 U	730 U	6 U	3000 UJ	30 U	740 U	730 U	720 U
Semivolatile Organics (ug/kg)													
2-METHYLNAPHTHALENE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	4100	400 U	1500 J	1450 J	1400 J
BIS(2-ETHYLHEXYL)PHTHALATE	210 J	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	750 J	160 J	450 J	450 J	2300 U
BUTYL BENZYL PHTHALATE	1200 U	6100 U	370 U	400 U	400 U	400 U	400 U	390 U	2000 U	400 U	2000 U	2150 U	2300 U
NAPHTHALENE	1200 U	7200	370 U	400 U	400 U	400 U	400 U	390 U	1500 J	81 J	620 J	570 J	520 J
Inorganics (mg/kg)													
ALUMINUM	7340	5750	16500	8400	12000	12350	12700	11700	27900	23800	21400	23100	24800
ANTIMONY	3 U	3.1 U	2.8 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	5.1 J	4.1 J	3.1 J
ARSENIC	1.2 J	1.1 J	3.4	1 J	1.6 J	2.2 J	2.8	1.8 J	5.9	2.2 J	2.8	2.95	3.1
BARIUM	20.7 J	11.8 J	17 J	145	9.6 J	10.9 J	12.2 J	17 J	22.6 J	49.5	91.2	129.6	168
BERYLLIUM	0.06 UJ	0.06 UJ	0.16 J	0.08 J	0.08 J	0.055 J	0.06 U	0.12 J	0.22 J	0.09 J	0.21 J	0.205 J	0.2 J
CADMIUM	1.1 J	0.68 U	0.87 J	13.9	0.66 U	0.66 U	0.66 U	0.66 U	0.65 U	8.4	22.4 J	26.5 J	30.6 J
CALCIUM	415 J	107 J	150 J	357 J	197 J	213 J	229 J	123 J	262 J	253 J	359 UJ	343.5 UJ	328 UJ
CHROMIUM	12.9	5.4	16.5	64.7	10.1	11.1	12.1	8.9	21.6	40	58.1 J	61.1 J	64.1 J
COBALT	1 J	0.38 U	1.3 J	0.98 J	0.86 J	0.98 J	1.1 J	1.1 J	1.4 J	1.5 J	3.6 UJ	3.15 UJ	2.7 UJ
COPPER	15.9	22.3	7.3	128	10.3	14.85	19.4	10	18.1	124	75.6 J	155.3 J	235 J
IRON	4640	2550	10100	4270	5900	5970	6040	5780	13500	11500	11900	11600	11300
LEAD	95.4	15.7	9	207	56.9	61.75	66.6	9.7	64.7	79.9	80.8	98.9	117
MAGNESIUM	148 J	105 J	183 J	358 J	121 J	141.5 J	162 J	175 J	238 J	267 J	484 J	502 J	520 J
MANGANESE	50.4	10	26.1	63.7	18.3	20.35	22.4	20	30	42.5	93.3	105.15 J	117 J
NICKEL	2.6 U	2.6 U	2.4 U	2.6 U	2.6 U	2 J	2.7 J	5.2 J	3.5 J	3.2 J	8.8 J	8.8 J	8.8 J
POTASSIUM	384 J	197 J	248 J	248 J	397 J	400 J	403 J	196 J	875 J	460 J	805 J	810.5 J	816 J
SILVER	0.47 J	0.44 J	0.34 U	0.36 U	0.36 U	0.395 J	0.61 J	0.36 U	0.36 U	0.5 J	0.36 U	0.355 J	0.53 J
SODIUM	167 J	199 J	209 J	198 J	257 J	220 J	183 J	178 J	193 J	157 J	209 UJ	198 UJ	187 UJ
VANADIUM	10 J	8.4 J	25	10.3 J	16.1	16.8	17.5	15.2	37.8	30.8	30.7	30.8	30.9
ZINC	56.4	20.7	10.2	179	13.8	18.6	23.4	11.1	21.9	73	131 J	144.5 J	158 J
Petroleum Hydrocarbon (mg/kg)													
TOTAL PETROLEUM HYDROCARBONS	9720	6790				647	647						

APPENDIX TABLE A-9-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-22	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
NSAMPLE	17-SL-22	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SAMPLE	17-SL-22	17-SL-23	17-SL-24	17-SL-25	17-SL-26	17-SL-27	17-SL-28	17-SL-29	17-SL-30	17-SL-31	17-SL-32	17-SL-33	17-SL-34
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/16/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992	8/15/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)													
2-BUTANONE	11 U	11 UJ	11 U	12 U	11 U	6 J	11 U	12 UJ	11 UJ	12 U	11 U	11 U	11 U
CARBON DISULFIDE	6 U	6 U	6 U	1 J	6 U	6 U	6 U	2 J	5 U	6 U	2 J	2 J	3 J
ETHYLBENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
METHYLENE CHLORIDE	21 UJ	15 UJ	13 UJ	31 UJ	19 UJ	22 UJ	26 UJ	69 J	11 UJ	32 UJ	39 UJ	25 UJ	37 UJ
TOLUENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U	1 J	5 U	6 U	6 U	6 U	6 U
TOTAL XYLENES	6 U	27	6 U	6 U	6 U	6 U	6 U	2 J	1 J	3 J	5 J	5 J	2 J
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ	5 U	6 U	6 U	6 U	6 U
Semivolatile Organics (ug/kg)													
2-METHYLNAPHTHALENE	1200 U	4900	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	1200 U	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	75 J	360 U	420 U	380 U	370 U	360 U
BUTYL BENZYL PHTHALATE	1200 U	2300 U	4800 U	780 U	400 U	1200 U	9900 UJ	420	360 U	420 U	380 U	370 U	360 U
NAPHTHALENE	1200 U	1000 J	4800 U	780 U	400 U	1200 U	9900 UJ	390 U	360 U	420 U	380 U	370 U	360 U
Inorganics (mg/kg)													
ALUMINUM	19200	17200	20900	17500	12700	9570	14200	14500	20000	7130	8510	26200	17700
ANTIMONY	2.9 U	2.9 U	3 U	3 U	2.9 U	3.1 U	3.1 U	2.9 U	2.7 U	10.3 J	2.8 U	2.8 U	2.7 U
ARSENIC	3.7	2.1 J	3.8	2.5	2.6	2.3 J	2.4 J	1.8 J	3.1	1.1 J	2 J	5	1.8 J
BARIUM	37.9 J	34.8 J	46.7 J	24.2 J	14.8 J	95.2	53.2	27.9 J	8.3 J	26.3 J	19.9 J	14.8 J	14.5 J
BERYLLIUM	0.15 J	0.06 J	0.16 J	0.08 J	0.07 J	0.12 J	0.07 J	0.17 J	0.16 J	0.08 J	0.06 U	0.21 J	0.19 J
CADMIUM	0.64 U	0.64 U	2.8	0.66 U	0.64 U	1.8	0.69 U	7.4	0.59 U	1.8	0.62 U	0.61 U	0.6 U
CALCIUM	270 J	333 J	518 J	339 J	780 J	196 J	210 J	532 J	151 J	280 J	340 J	439 J	411 J
CHROMIUM	18.5	18.7	30.3	16.9	13.2	15.8	16.3	82.1	15	15.7	12.6	17.9	12.4
COBALT	1.8 J	1.8 J	2.1 J	1.7 J	1.1 J	0.72 J	1.1 J	1.8 J	1.3 J	0.67 J	0.59 J	1.3 J	1.5 J
COPPER	18.2	218	14.1	19.8	24.5	22.9	27.1	139	5.1 J	14.5	8.7	11.9	7
IRON	11700	7520	11200	9690	7030	4880	7710	6980	10900	3900	4930	13900	9180
LEAD	31.7	87.2	48.4	29.2	26.5	79.6	35.9	19.9	8.6	98	25.9	59.6	8.7
MAGNESIUM	256 J	378 J	461 J	187 J	159 J	128 J	167 J	302 J	97.4 J	95.1 J	123 J	194 J	140 J
MANGANESE	94.4	144	95.4	59.3	60.7	21.5	38.9	194	27.3	17.9	35.7	80.1	187
NICKEL	3.1 J	2.5 U	4.9 J	2.8 J	3.3 J	2.7 U	2.7 U	4 J	2.3 U	2.8 U	2.4 U	4.6 J	2.9 J
POTASSIUM	1090 J	1350	641 J	544 J	564 J	331 J	616 J	153 J	184 J	155 U	155 J	134 U	131 U
SILVER	0.35 U	0.35 U	0.36 U	0.53 J	0.35 U	0.37 U	0.37 U	0.35 U	0.32 U	0.38 U	0.34 U	0.33 U	0.33 U
SODIUM	162 J	181 J	167 J	163 J	193 J	271 J	277 J	179 J	186 J	206 J	133 J	136 J	151 J
VANADIUM	31.7	20.1	30.9	27.4	19.3	13.8	20.4	19.6	33	10.8 J	14.1	39.4	24.8
ZINC	25.1	35.5	52.8	23.3	41.9	48.3	49.8	54.6	11.1	43	20.5	19.7	10.1
Petroleum Hydrocarbon (mg/kg)													
TOTAL PETROLEUM HYDROCARBONS	1040	5540	2340	160	208	2820	5940						

APPENDIX TABLE A-9-6
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-02	17-SB-02	17-SB-03	17-SB-04	17-SB-04	17-SB-05	17-SB-05	17-SB-05	17-SB-05	17-SB-06	17-SB-06
NSAMPLE	17SB1-5-7	17SB2-10-12	17SB2-5-7	17SB3-10-12	17SB4-10-12	17SB4-5-7	17SB5-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7-D	17SB6-10-12	17SB6-5-7
SAMPLE	17SB1-5-7	17SB2-10-12	17SB2-5-7	17SB3-10-12	17SB4-10-12	17SB4-5-7	17SB5-10-12	17SB5-5-7	17SB5-5-7-AVG	17SB5-5-7A	17SB6-10-12	17SB6-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/19/1993	1/19/1993	1/7/1993	1/7/1993	1/7/1993	1/19/1993	1/19/1993	1/19/1993	1/19/1993	1/7/1993	1/7/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
2-BUTANONE	11 UJ	11 UJ	12 UJ	11 U	12 U	11 U	12 UJ	18 J	20.5 J	23 J	11 U	34
4-METHYL-2-PENTANONE	11 UJ	11 UJ	12 UJ	11 U	12 U	11 U	12 UJ	12 UJ	12 UJ	12 UJ	11 U	4 J
ACETONE	11 J	18	47	54 UJ	97 UJ	100 UJ	19	12 UJ	12 UJ	12 UJ	62 UJ	13 U
Semivolatile Organics (ug/kg)												
DI-N-BUTYL PHTHALATE	380 U	370 U	390 U	380 U	370 U	390 U	390 U	400 UJ	400 UJ	400 UJ	350 U	400 U
DIETHYL PHTHALATE	380 U	370 U	390 U	380 U	94 J	390 U	390 U	400 U	400 U	400 U	350 U	400 U
Pesticides PCBs (ug/kg)												
4,4'-DDE	3.8 UJ	3.7 UJ	3.9 UJ	3.8 UJ	3.7 UJ	3.9 UJ	3.9 UJ	4 UJ	4 UJ	4 UJ	3.5 UJ	6.5 J
4,4'-DDT	3.8 UJ	3.7 UJ	3.9 UJ	3.8 UJ	3.7 UJ	3.9 UJ	3.9 UJ	4 UJ	4 UJ	4 UJ	3.5 UJ	19
Inorganics (mg/kg)												
ALUMINUM	33200	26000	55200	5800	4550	10000	7650	3940 J	12520 J	21100 J	3730	9250
ANTIMONY	5.6 U	5.5 U	5.8 U	2.8 U	2.7 U	2.9 U	5.8 U	5.9 R	5.9 R	5.9 R	2.6 U	3 U
ARSENIC	8	6.2	2.2 J	2.1 J	1.3 J	0.5 J	2.2 J	2.1 J	2.7 J	3.3	0.68 J	0.71 J
BARIUM	14.3 J	4.1 J	10 J	2.4 J	2.5 J	4.8 J	3.8 J	5.3 J	6.8 J	8.3 J	1.5 J	3.9 J
BERYLLIUM	0.28 J	0.21 J	0.45 J	0.11 U	0.11 U	0.12 U	0.13 J	0.27 UJ	0.32 UJ	0.37 UJ	0.11 U	0.12 U
CADMIUM	0.89 U	0.88 U	0.93 U	0.28 U	0.27 U	0.75 J	0.93 U	0.95 UJ	0.95 UJ	0.95 UJ	0.26 U	2.5
CALCIUM	87.9 J	21.8 J	85.9 J	79.7 J	80.8 J	156 J	159 J	24.1 UJ	27.95 UJ	31.8 UJ	64.9 J	147 J
CHROMIUM	27.9	18.8	45.4	9.3	10.3	26.3	10.6	23.7 J	29.4 J	35.1 J	4.8	50.5
COBALT	0.83 J	0.5 U	0.57 J	1.3 U	1.3 U	1.4 U	0.53 U	0.54 UJ	0.635 J	1 J	1.2 U	1.6 J
COPPER	6.7	5 J	9.9	2.6 J	3.2 J	6.3	7.8	4.3 J	6.1 J	7.9 J	3.7 J	22.7
IRON	22300	17800	39100	10400	11900	29300	12400	25500	34450	43400	6240	89800
LEAD	44.7	5.2	7.8	2.9	2.8	2.6	3.5	4.4 J	5.6 J	6.8 J	0.92	8.3
MAGNESIUM	177 J	79.9 J	186 J	33.6 J	37.6 J	84.8 J	111 J	22.4 UJ	43.45 UJ	64.5 UJ	18.3 J	45.5 J
MANGANESE	40.6	20.1	32.4	12.4	13.1	27.9	42.6	15.6	22.8	30	78.2	226
MERCURY	0.02 U	0.02 U	0.03 J	0.03 U	0.03 J	0.03 U	0.02 U	0.03 J	0.025 J	0.02 J	0.03 U	0.04 J
NICKEL	4.1 J	2.8 U	4.2 J	1.8 U	1.7 U	1.8 U	2.9 U	3 UJ	3 UJ	3 UJ	1.6 U	3.1 J
POTASSIUM	1180	114 U	121 U	96.9 J	42.7 U	53.6 J	121 U	222 J	283.5 J	345 J	40.9 U	437 J
SELENIUM	4	4.5	2.3	0.11 U	0.11 U	0.12 U	1.1 J	0.59 J	0.73 J	0.87 J	0.11 U	0.12 U
SILVER	0.71 J	0.69 J	1.3 J	0.48 U	0.47 U	0.5 U	0.78 J	0.86 J	1.38 J	1.9 J	0.45 U	1.3 J
SODIUM	19.9 J	23.5 J	49.7 J	184 J	204 J	207 J	13.1 U	30.2 J	30.2 J	33.4 UJ	168 J	185 J
VANADIUM	57.6	47.3	100	27.7	31.2	74	37.8	68 J	79.9 J	91.8 J	15.7	105
ZINC	6.8	3.2 J	5.8	4.3 J	4.8	8.9	1.9 J	2.9 UJ	3.375 J	5.3 J	2.9 J	18.9
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.51 J	0.52 J	0.51 J	0.17 U	0.17 U	0.18 U	0.51 J	0.62 UJ	0.61 UJ	0.6 UJ	0.16 U	0.18 U

APPENDIX TABLE A-9-6
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017
LOCATION	17-SB-07	17-SB-08	17-SB-08	17-SB-09	17-SB-09
NSAMPLE	17SB7-5-7	17SB8-10-12	17SB8-5-7	17SB9-10-12	17SB9-5-7
SAMPLE	17SB7-5-7	17SB8-10-12	17SB8-5-7	17SB9-10-12	17SB9-5-7
SUBMATRIX	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/18/1993	1/18/1993	1/18/1993	1/6/1993	1/6/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)					
2-BUTANONE	12 U	11 U	12 U	12 U	12 U
4-METHYL-2-PENTANONE	12 U	11 U	12 U	12 U	12 U
ACETONE	26 J	11 J	82 J	130 J	120 UJ
Semivolatile Organics (ug/k					
DI-N-BUTYL PHTHALATE	390 UJ	310	400 UJ	380 U	390 U
DIETHYL PHTHALATE	390 U	360 U	400 U	380 U	390 U
Pesticides PCBs (ug/kg)					
4,4'-DDE	3.9 UJ	3.6 UJ	4 U	3.8 UJ	3.9 UJ
4,4'-DDT	3.9 UJ	3.6 UJ	4 U	3.8 UJ	3.9 UJ
Inorganics (mg/kg)					
ALUMINUM	45000	19000	53300	6220	7800
ANTIMONY	8 J	5.4 U	6 U	5.8 U	7 J
ARSENIC	2.4 J	3.1 J	6.4	1.8 J	3
BARIUM	7.2 J	3.8 J	10.5 J	3.6 J	3 J
BERYLLIUM	0.07 U	0.06 U	0.07 U	0.06 U	0.06 U
CADMIUM	0.99 U	0.87 U	0.95 U	0.92 U	0.93 U
CALCIUM	16.9 J	7.2 U	7.9 U	7.7 U	7.7 U
CHROMIUM	45.8	12.8	46.1	19.9	24.3
COBALT	4.2 J	0.64 J	4.4 J	0.92 J	2.1 J
COPPER	1.4 J	2.3 J	5.4 J	0.39 U	0.39 U
IRON	50700	10500	48400	22200	31600
LEAD	6.9	2.7	8.5	5.4	8
MAGNESIUM	115 J	64.7 J	187 J	27.1 J	30.7 J
MANGANESE	76.9	28.7	41.5	15	24.4
MERCURY	0.02 U	0.02 U	0.02 U	0.03 J	0.02 J
NICKEL	3.1 J	3.9 J	6.9 J	2.9 U	2.9 U
POTASSIUM	319 J	112 U	736 J	120 U	121 U
SELENIUM	0.64 J	0.61 J	3.4	0.5 U	0.65 J
SILVER	1 J	0.53 U	1.4 J	0.81 J	1.2 J
SODIUM	13.9 U	12.2 U	16.4 J	13 U	13.1 U
VANADIUM	99.3	27.8	95.7	60.5	82
ZINC	1.6 J	1.7 J	3.3 J	0.37 U	0.37 U
Miscellaneous Parameters (					
CYANIDE	0.66 J	0.46 J	0.45 J	0.48 J	0.53 J

APPENDIX TABLE A-9-7
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017
LOCATION	17-SB-01	17-SB-01	17-SB-05	17-SB-07
NSAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SAMPLE	17SB1-15-17	17SB1-60-62	17SB5-20-22	17SB7-15-17
SUBMATRIX	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	60 - 62	20 - 22	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/19/1993	1/7/1993	1/19/1993	1/18/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)				
ACETONE	29 J		10 UJ	14 J
Inorganics (mg/kg)				
ALUMINUM	24600	347	1180	1540
ARSENIC	5.5	0.15 U	0.43 J	1.1 J
BARIUM	5.8 J	0.51 J	0.32 J	0.1 UJ
BERYLLIUM	0.15 J	0.11 U	0.06 U	0.06 U
CALCIUM	41.3 J	70.3 J	7.6 J	14.2 J
CHROMIUM	15.9	2.1 J	1.2 J	2.3
COPPER	4.3 J	1.2 J	0.34 U	1.1 J
IRON	13200	457	742	1330
LEAD	3.4	0.3 J	0.18 J	0.8 J
MAGNESIUM	96.4 J	14.3 J	7.3 U	9.4 J
MANGANESE	15.1	2.4 J	1.5 J	7
MERCURY	0.02 U	0.04 J	0.02 U	0.02 U
NICKEL	2.8 J	1.7 U	2.5 U	2.6 U
SELENIUM	1.5	0.11 U	0.44 U	0.91 J
SODIUM	12.2 U	169 J	11.4 U	11.5 U
VANADIUM	36.4	1.6 J	1.6 J	3.1 J
ZINC	3.3 J	3.8 J	0.52 J	0.81 J
Miscellaneous Parameters (mg/kg)				
CYANIDE	0.52 J	0.16 U	0.46 J	0.43 J

APPENDIX TABLE A-9-8
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL TCLP ANALYSES
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0017	0017	0017	0017	0017	0017	0017	0017
LOCATION	17-SL-02	17-SL-07	17-SL-09	17-SL-11	17-SL-15	17-SL-17	17-SL-21	17-SL-25
NSAMPLE	17-SL-02TCLP	17-SL-07TCLP	17-SL-09TCLP	17-SL-11TCLP	17-SL-15TCLP	17-SL-17TCLP	17-SL-21TCLP	17-SL-25TCLP
SAMPLE	17-SL-02TCLP	17-SL-07TCLP	17-SL-09TCLP	17-SL-11TCLP	17-SL-15TCLP	17-SL-17TCLP	17-SL-21TCLP	17-SL-25TCLP
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8	0 - 8
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/15/1992	8/15/1992	8/15/1992	8/16/1992	8/15/1992	8/16/1992	8/16/1992	8/16/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
TCLP Metals (ug/L)								
BARIUM	740	724	618	980	966	1130	1350	1100
CADMIUM	27.7	2.7 U	2.7 U	5.6	3.6 J	12.3	136	14.9
CHROMIUM	1.9 U	2.3 J	1.9 U	2.4 J	1.9 U	2.7 J	3.1 J	3.1 J
LEAD	430	11.8 U	11.8 U	1780	11.8 U	366	488	79.3
MERCURY	0.16 U	0.16 U	0.16 U	0.12 UJ	0.16 U	0.19 J	0.39 UJ	0.14 J

APPENDIX TABLE A-9-9
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	3/34	6 J	80 J	11 - 15000	285	47.0	17-SL-14
CARBON DISULFIDE	14/34	1 J	26 J	5 - 7300	139	4.29	17-SL-14
ETHYLBENZENE	6/34	2 J	14000 J	5 - 740	710	3886	17-SL-19
METHYLENE CHLORIDE	2/34	69 J	130 J	7 - 7300	155	99.5	17-SL-16
TOLUENE	4/34	1 J	23000 J	5 - 7300	772	5760	17-SL-19
TOTAL XYLENES	20/34	1 J	130000 J	6 - 730	5738	9735	17-SL-19
TRICHLOROETHENE	2/34	2 J	160 J	5 - 7300	133	81.0	17-SL-02
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	5/34	190 J	4900	360 - 9900	892	2578	17-SL-23
BIS(2-ETHYLHEXYL)PHTHALATE	7/34	49 J	750 J	360 - 9900	584	301	17-SL-19
BUTYL BENZYL PHTHALATE	3/34	360 J	490	360 - 9900	658	423	17-SL-03
NAPHTHALENE	6/34	81 J	7200	360 - 9900	773	1959	17-SL-14
Inorganics (mg/kg)							
ALUMINUM	34/34	4500	29900	---	13710	13710	17-SL-10
ANTIMONY	3/34	3.1 J	10.3 J	2.7 - 3.2	1.86	5.90	17-SL-31
ARSENIC	33/34	0.29 J	5.9	1.5 - 1.6	2.11	2.15	17-SL-19
BARIUM	34/34	3.6 J	168	---	28.8	28.8	17-SL-21-D
BERYLLIUM	25/34	0.06 J	0.22 J	0.05 - 0.06	0.0950	0.119	17-SL-19
CADMIUM	15/34	0.76 J	30.6 J	0.59 - 0.7	2.49	5.23	17-SL-21-D
CALCIUM	32/34	94.9 J	780 J	312 - 520	254	258	17-SL-26
CHROMIUM	34/34	4	82.1	---	20.0	20.0	17-SL-29
COBALT	30/34	0.59 J	2.4 J	0.37 - 4.7	1.36	1.42	17-SL-01
COPPER	34/34	2.4 J	235 J	---	34.6	34.6	17-SL-21-D
IRON	34/34	2550	23800	---	7737	7737	17-SL-07
LEAD	34/34	3	207	---	46.2	46.2	17-SL-16
MAGNESIUM	34/34	59.1 J	520 J	---	185	185	17-SL-21-D
MANGANESE	34/34	5.1	198	---	56.5	56.5	17-SL-01
NICKEL	23/34	2.7 J	14.7	2.3 - 2.8	3.36	4.36	17-SL-11-D
POTASSIUM	25/34	153 J	1350	131 - 155	336	432	17-SL-23
SILVER	6/34	0.44 J	0.61 J	0.32 - 0.38	0.224	0.448	17-SL-17-D
SODIUM	32/34	133 J	279 J	187 - 211	186	191	17-SL-07
VANADIUM	34/34	6.4 J	71.3	---	20.3	20.3	17-SL-07
ZINC	34/34	7.2 J	179	---	37.0	37.0	17-SL-16
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	18/21	2.3	19300	1.8 - 2	3187	3718	17-SL-06
TCLP Metals (ug/L)							
BARIUM, TCLP	8/8	618	1350	---	951	951	17-SL-21TCLP
CADMIUM, TCLP	6/8	3.6 J	136	2.7	25.4	33.4	17-SL-21TCLP
CHROMIUM, TCLP	5/8	2.3 J	3.1 J	1.9	2.06	2.72	17-SL-21TCLP
LEAD, TCLP	5/8	79.3	1780	11.8	395	629	17-SL-11TCLP
MERCURY, TCLP	2/8	0.14 J	0.19 J	0.12 - 0.39	0.113	0.165	17-SL-17TCLP

APPENDIX TABLE A-9-10
SUMMARY OF DESCRIPTIVE STATISTICS - SHALLOW SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	2/15	18 J	34	11 - 12	8.63	27.3	17SB6-5-7
4-METHYL-2-PENTANONE	1/15	4 J	4 J	11 - 12	5.67	4.00	17SB6-5-7
ACETONE	8/15	11 J	130 J	12 - 120	38.2	43.0	17SB9-10-12
Semivolatile Organics (ug/kg)							
DI-N-BUTYL PHTHALATE	1/15	310	310	350 - 400	200	310	17SB8-10-12
DIETHYL PHTHALATE	1/15	94 J	94 J	350 - 400	185	94.0	17SB4-10-12
Pesticides PCBs (ug/kg)							
4,4'-DDE	1/15	6.5 J	6.5 J	3.5 - 4	2.21	6.50	17SB6-5-7
4,4'-DDT	1/15	19	19	3.5 - 4	3.05	19.0	17SB6-5-7
Inorganics (mg/kg)							
ALUMINUM	15/15	3730	55200	---	19948	19948	17SB2-5-7
ANTIMONY	2/14	7 J	8 J	2.6 - 6	3.00	7.50	17SB7-5-7
ARSENIC	15/15	0.5 J	8	---	2.89	2.89	17SB1-5-7
BARIUM	15/15	1.5 J	14.3 J	---	5.48	5.48	17SB1-5-7
BERYLLIUM	4/15	0.13 J	0.45 J	0.06 - 0.37	0.112	0.268	17SB2-5-7
CADMIUM	2/15	0.75 J	2.5	0.26 - 0.99	0.552	1.63	17SB6-5-7
CALCIUM	10/15	16.9 J	159 J	7.2 - 31.8	61.9	90.0	17SB5-10-12
CHROMIUM	15/15	4.8	50.5	---	25.5	25.5	17SB6-5-7
COBALT	9/15	0.57 J	4.4 J	0.5 - 1.4	1.27	1.77	17SB8-5-7
COPPER	13/15	1.4 J	22.7	0.39	5.57	6.39	17SB6-5-7
IRON	15/15	6240	89800	---	29139	29139	17SB6-5-7
LEAD	15/15	0.92	44.7	---	7.72	7.72	17SB1-5-7
MAGNESIUM	14/15	18.3 J	187 J	22.4 - 64.5	81.3	85.6	17SB8-5-7
MANGANESE	15/15	12.4	226	---	46.8	46.8	17SB6-5-7
MERCURY	6/15	0.02 J	0.04 J	0.02 - 0.03	0.0187	0.0292	17SB6-5-7
NICKEL	6/15	3.1 J	6.9 J	1.6 - 3	2.40	4.22	17SB8-5-7
POTASSIUM	7/15	53.6 J	1180	40.9 - 121	233	444	17SB1-5-7
SELENIUM	9/15	0.59 J	4.5	0.11 - 0.5	1.23	1.99	17SB2-10-12
SILVER	10/15	0.69 J	1.9 J	0.45 - 0.53	0.786	1.06	17SB5-5-7-D
SODIUM	10/15	16.4 J	207 J	12.2 - 33.4	74.7	109	17SB4-5-7
VANADIUM	15/15	15.7	105	---	62.8	62.8	17SB6-5-7
ZINC	13/15	1.6 J	18.9	0.37 - 2.9	4.52	5.19	17SB6-5-7
Miscellaneous Parameter (mg/kg)							
CYANIDE	9/15	0.45 J	0.66 J	0.16 - 0.62	0.358	0.514	17SB7-5-7

APPENDIX TABLE A-9-11
SUMMARY OF DESCRIPTIVE STATISTICS - DEEP SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detect
Volatile Organics (ug/kg)							
ACETONE	2/3	14 J	29 J	10	16.0	21.5	17SB1-15-17
Inorganics (mg/kg)							
ALUMINUM	4/4	347	24600	---	6917	6917	17SB1-15-17
ARSENIC	3/4	0.43 J	5.5	0.15	1.78	2.34	17SB1-15-17
BARIUM	3/4	0.32 J	5.8 J	0.1	1.67	2.21	17SB1-15-17
BERYLLIUM	1/4	0.15 J	0.15 J	0.06 - 0.11	0.0663	0.150	17SB1-15-17
CALCIUM	4/4	7.6 J	70.3 J	---	33.4	33.4	17SB1-60-62
CHROMIUM	4/4	1.2 J	15.9	---	5.38	5.38	17SB1-15-17
COPPER	3/4	1.1 J	4.3 J	0.34	1.69	2.20	17SB1-15-17
IRON	4/4	457	13200	---	3932	3932	17SB1-15-17
LEAD	4/4	0.18 J	3.4	---	1.17	1.17	17SB1-15-17
MAGNESIUM	3/4	9.4 J	96.4 J	7.3	30.9	40.0	17SB1-15-17
MANGANESE	4/4	1.5 J	15.1	---	6.50	6.50	17SB1-15-17
MERCURY	1/4	0.04 J	0.04 J	0.02	0.0175	0.0400	17SB1-60-62
NICKEL	1/4	2.8 J	2.8 J	1.7 - 2.6	1.55	2.80	17SB1-15-17
SELENIUM	2/4	0.91 J	1.5	0.11 - 0.44	0.671	1.21	17SB1-15-17
SODIUM	1/4	169 J	169 J	11.4 - 12.2	46.6	169	17SB1-60-62
VANADIUM	4/4	1.6 J	36.4	---	10.7	10.7	17SB1-15-17
ZINC	4/4	0.52 J	3.8 J	---	2.11	2.11	17SB1-60-62
Miscellaneous Parameters (mg/kg)							
CYANIDE	3/4	0.43 J	0.52 J	0.16	0.373	0.470	17SB1-15-17

APPENDIX TABLE A-9-12
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

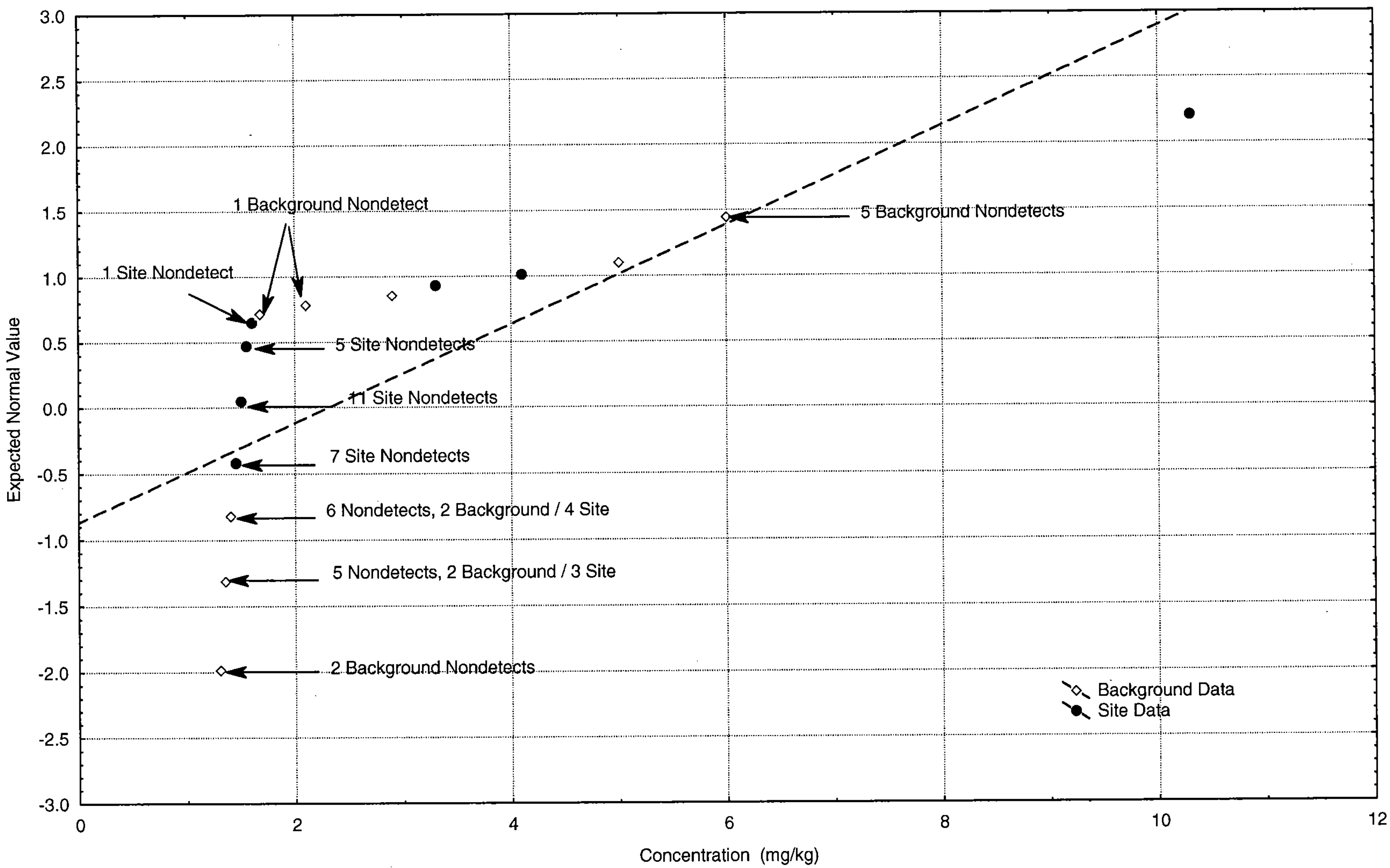
Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Mininum Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)													
2-BUTANONE	**34**	**3**	**9%**	**6.00**	**80.0**	**285**	**47.0**	**869**	**3.75**	**Shapiro-Wilk**	**Undefined**	**80.0**	**Maximum Detected Concentration**
CARBON DISULFIDE	**34**	**14**	**41%**	**1.00**	**26.0**	**139**	**4.29**	**427**	**3.72**	**Shapiro-Wilk**	**Undefined**	**26.0**	**Maximum Detected Concentration**
ETHYLBENZENE	**34**	**6**	**18%**	**2.00**	**14000**	**710**	**3886**	**2763**	**4.29**	**Shapiro-Wilk**	**Undefined**	**1493**	**Non-Parametric UCL**
METHYLENE CHLORIDE	**34**	**2**	**6%**	**69.0**	**130**	**155**	**99.5**	**423**	**3.72**	**Shapiro-Wilk**	**Undefined**	**130**	**Maximum Detected Concentration**
TOLUENE	**34**	**4**	**12%**	**1.00**	**23000**	**772**	**5760**	**3943**	**5.76**	**Shapiro-Wilk**	**Undefined**	**1822**	**Non-Parametric UCL**
TOTAL XYLENES	**34**	**20**	**59%**	**1.00**	**130000**	**5738**	**9735**	**24042**	**4.74**	**Shapiro-Wilk**	**Undefined**	**12594**	**Non-Parametric UCL**
TRICHLOROETHENE	**34**	**2**	**6%**	**2.00**	**160**	**133**	**81.0**	**425**	**3.81**	**Shapiro-Wilk**	**Undefined**	**160**	**Maximum Detected Concentration**
Semivolatile Organics (ug/kg)													
2-METHYLNAPHTHALENE	**34**	**5**	**15%**	**190**	**4900**	**892**	**2578**	**1383**	**2.10**	**Shapiro-Wilk**	**Undefined**	**1269**	**Non-Parametric UCL**
BIS(2-ETHYLHEXYL)PHTHALATE	**34**	**7**	**21%**	**49.0**	**750**	**584**	**301**	**993**	**3.38**	**Shapiro-Wilk**	**Undefined**	**750**	**Maximum Detected Concentration**
BUTYL BENZYL PHTHALATE	**34**	**3**	**9%**	**360**	**490**	**658**	**423**	**984**	**3.26**	**Shapiro-Wilk**	**Undefined**	**490**	**Maximum Detected Concentration**
NAPHTHALENE	**34**	**6**	**18%**	**81.0**	**7200**	**773**	**1959**	**1456**	**3.53**	**Shapiro-Wilk**	**Undefined**	**1178**	**Non-Parametric UCL**
Inorganics (mg/kg)													
ALUMINUM	34	34	100%	4500	29900	13710	13710	7806	0.698	Shapiro-Wilk	Undefined	15853	Non-Parametric UCL
ANTIMONY	**34**	**3**	**9%**	**3.30**	**10.3**	**1.86**	**5.90**	**1.59**	**4.94**	**Shapiro-Wilk**	**Undefined**	**2.29**	**Non-Parametric UCL**
ARSENIC	34	33	97%	0.290	5.90	2.11	2.15	1.37	0.967	Shapiro-Wilk	Lognormal	2.85	H-UCL
BARIUM	34	34	100%	3.60	145	28.8	28.8	32.9	2.54	Shapiro-Wilk	Lognormal	38.1	H-UCL
BERYLLIUM	34	25	74%	0.055	0.220	0.095	0.119	0.061	0.644	Shapiro-Wilk	Undefined	0.112	Non-Parametric UCL
CADMIUM	**34**	**15**	**44%**	**0.760**	**26.5**	**2.49**	**5.23**	**5.18**	**3.60**	**Shapiro-Wilk**	**Undefined**	3.90	Non-Parametric UCL
CALCIUM	34	32	94%	94.9	780	254	258	154	1.49	Shapiro-Wilk	Lognormal	309	H-UCL
CHROMIUM	34	34	100%	4.00	82.1	20.0	20.0	17.5	2.30	Shapiro-Wilk	Lognormal	25.8	H-UCL
COBALT	34	30	88%	0.590	2.40	1.36	1.42	0.532	-0.363	Shapiro-Wilk	Normal	1.51	Student-t
COPPER	34	34	100%	2.40	218	34.6	34.6	52.4	2.29	Shapiro-Wilk	Undefined	49.0	Non-Parametric UCL
IRON	34	34	100%	2550	23800	7737	7737	4732	1.33	Shapiro-Wilk	Lognormal	9551	H-UCL
LEAD	34	34	100%	3.00	207	46.2	46.2	46.0	1.65	Shapiro-Wilk	Lognormal	87.0	H-UCL
MAGNESIUM	34	34	100%	59.1	502	185	185	106	1.61	Shapiro-Wilk	Lognormal	218	H-UCL
MANGANESE	34	34	100%	5.10	198	56.5	56.5	53.6	1.60	Shapiro-Wilk	Lognormal	82.3	H-UCL
NICKEL	**34**	**23**	**68%**	**2.00**	**11.6**	**3.36**	**4.36**	**2.26**	**1.82**	**Shapiro-Wilk**	**Undefined**	3.98	Non-Parametric UCL
POTASSIUM	34	25	74%	153	1350	336	432	314	1.66	Shapiro-Wilk	Undefined	423	Non-Parametric UCL
SILVER	**34**	**6**	**18%**	**0.355**	**0.530**	**0.224**	**0.448**	**0.109**	**1.97**	**Shapiro-Wilk**	**Undefined**	0.254	Non-Parametric UCL
SODIUM	34	32	94%	133	279	186	191	41.9	0.343	Shapiro-Wilk	Normal/Lognormal	198	Student-t
VANADIUM	34	34	100%	6.40	71.3	20.3	20.3	13.6	1.75	Shapiro-Wilk	Lognormal	25.2	H-UCL
ZINC	34	34	100%	7.20	179	37.0	37.0	38.2	2.35	Shapiro-Wilk	Lognormal	50.9	H-UCL
Petroleum Hydrocarbon (mg/kg)													
TOTAL PETROLEUM HYDROCARBONS	21	18	86%	2.30	19300	3187	3718	5089	2.01	Shapiro-Wilk	Undefined	4957	Non-Parametric UCL

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

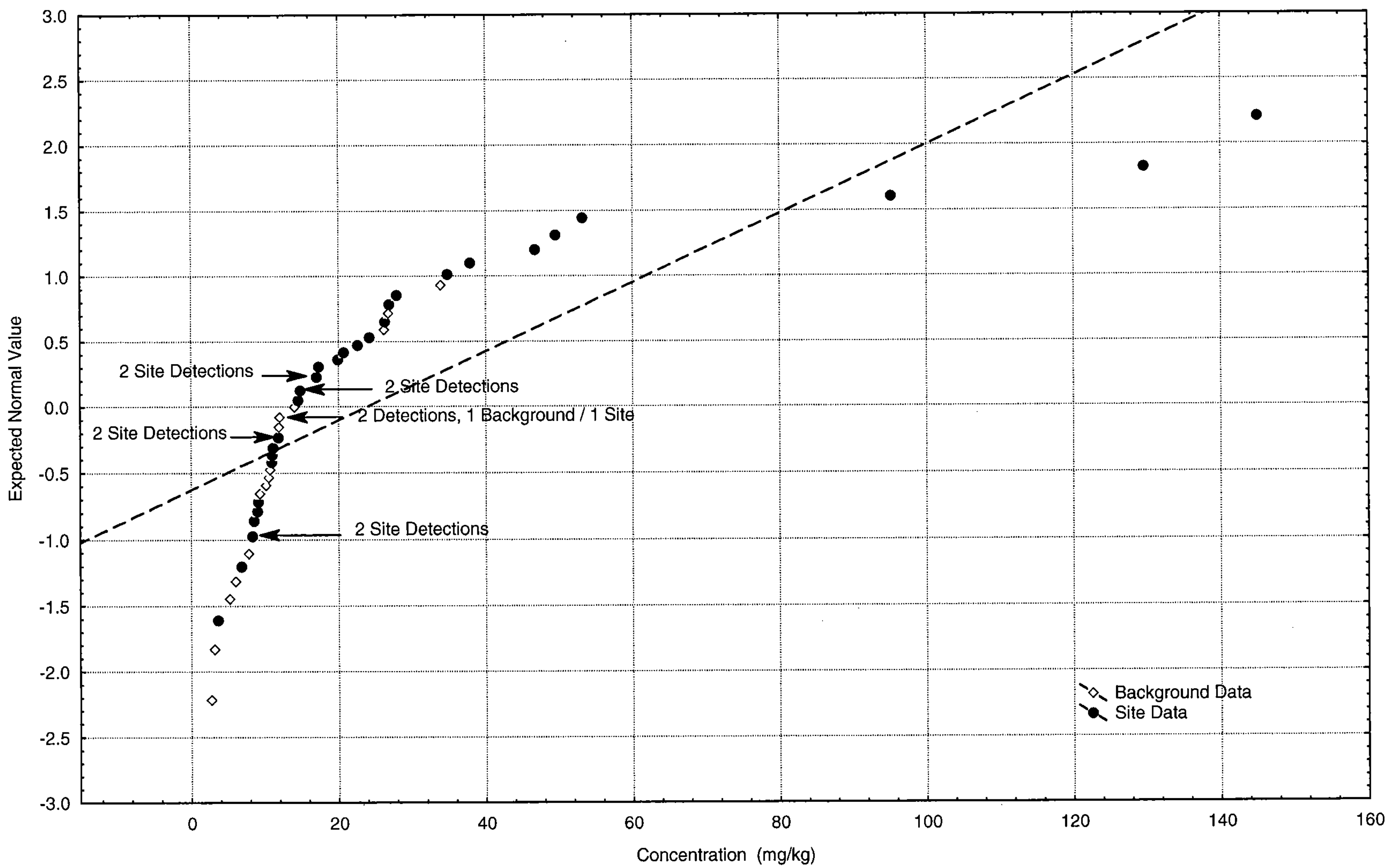
APPENDIX TABLE A-9-13
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 17 SURFACE SOIL																			
BARIUM	34/34	15/15	49/49	0%	PASS	145	33.9 J	28.8	12.7	LOGNORMAL	LOGNORMAL	PASS	PASS	Student's T	6.87	0.0117	**YES**	---	**YES**
BERYLLIUM	25/34	8/15	33/49	33%	PASS	0.22 J	0.35 J	0.0950	0.195	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	-1.13	0.258	NO	PASS	NO
COBALT	30/34	12/15	42/49	14%	PASS	2.4 J	2.9 J	1.36	1.48	NORMAL	LOGNORMAL	**FAIL**	---	WRS	0.978	0.328	NO	PASS	NO
COPPER	34/34	12/15	46/49	6%	PASS	218	8.5	34.6	3.97	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	4.95	0.000001	**YES**	---	**YES**
NICKEL	23/34	**6/15**	29/49	41%	**FAIL**	11.6 J	5.9 J	3.36	2.65	---	---	---	---	Proportions	1.02	0.155	NO	PASS	NO
SITE 17 SUBSURFACE SOIL																			
BERYLLIUM	4/15	10/14	14/29	52%	**FAIL**	0.45 J	0.23 J	0.112	0.101	---	---	---	---	Proportions	-0.277	0.39	NO	PASS	NO
CADMIUM	2/15	9/14	11/29	62%	**FAIL**	2.5	0.71 J	0.552	0.343	---	---	---	---	Proportions	1.407	0.08	NO	PASS	NO

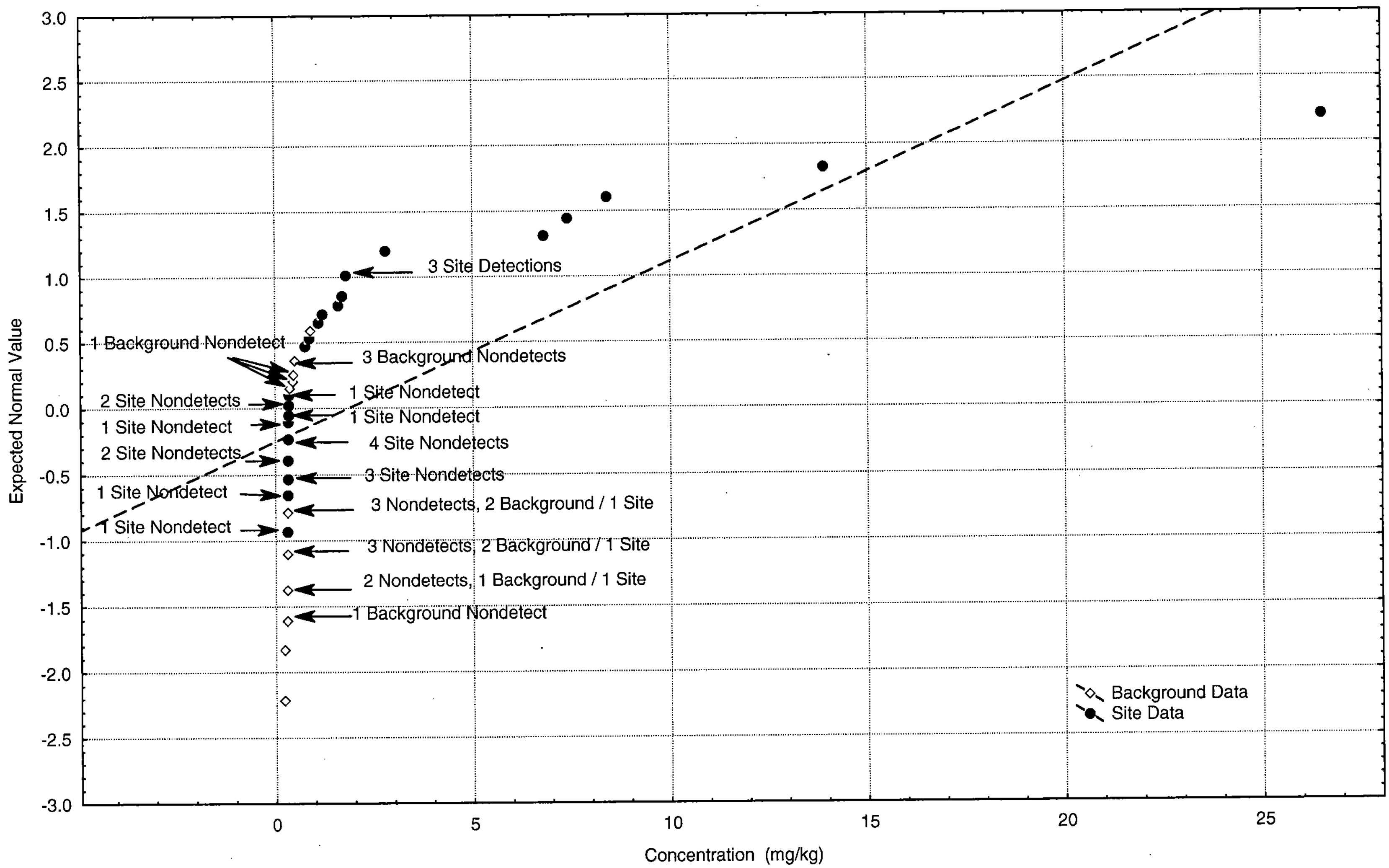
APPENDIX FIGURE A-9-1
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



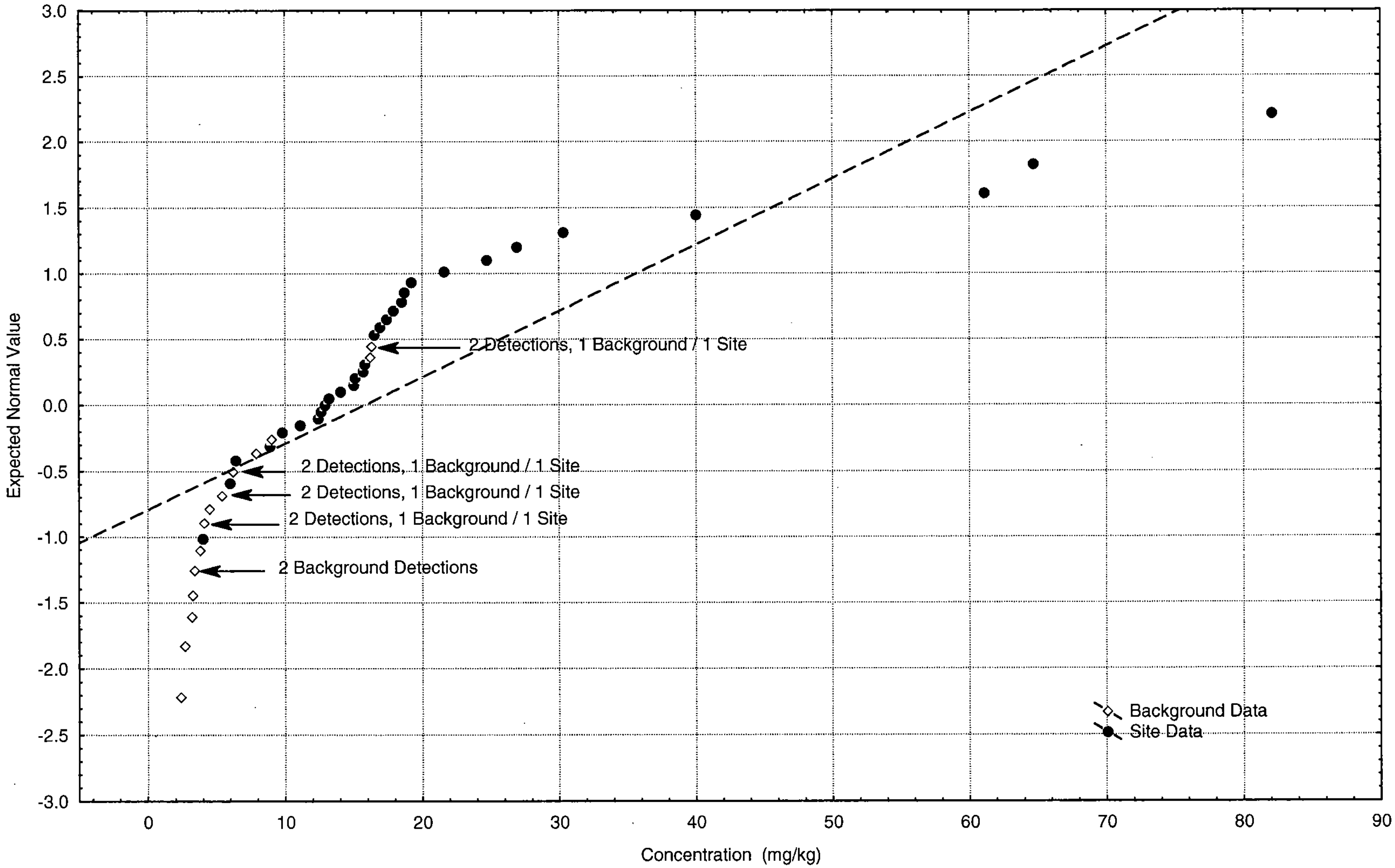
APPENDIX FIGURE A-9-2
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



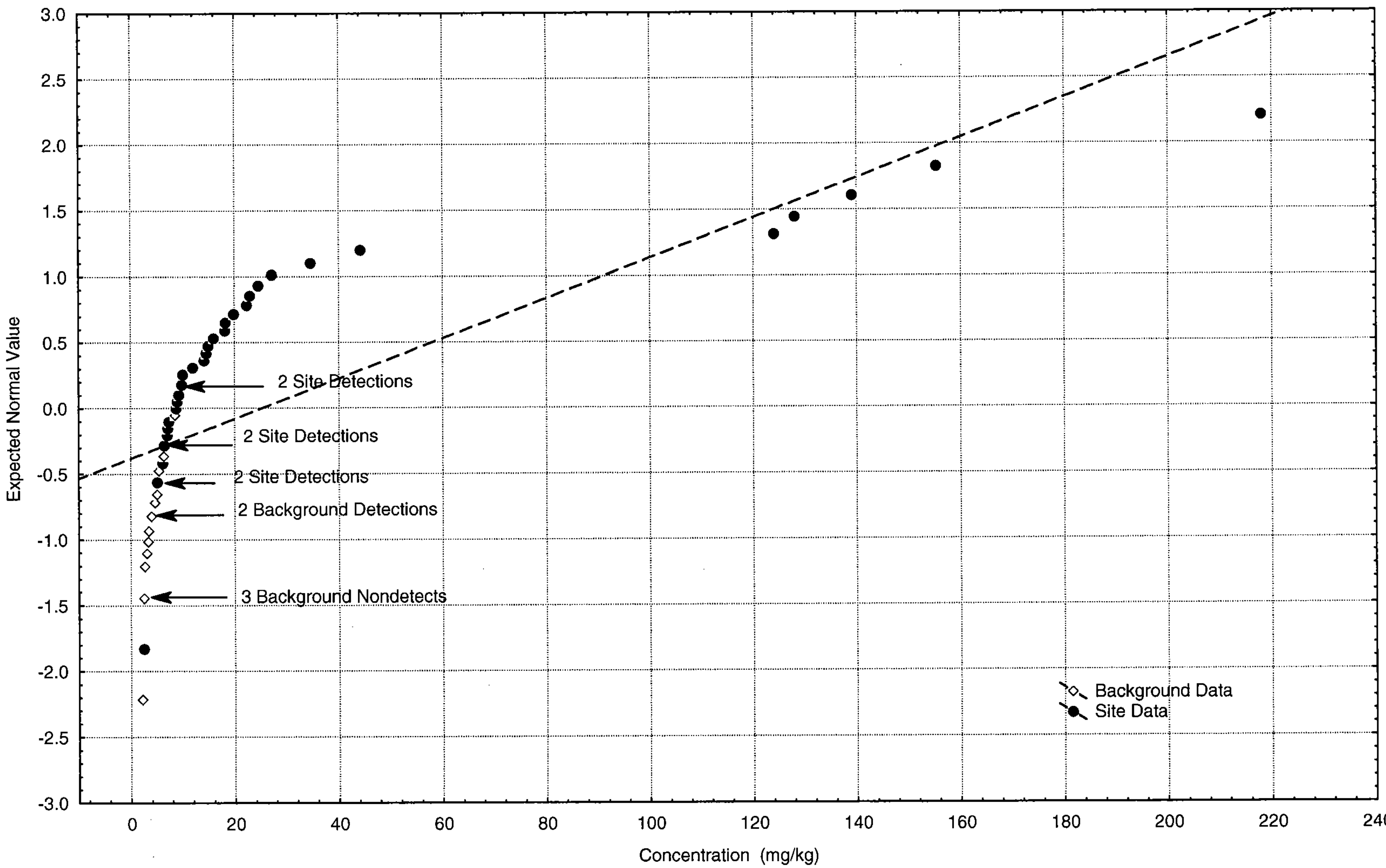
APPENDIX FIGURE A-9-3
NORMAL PROBABILITY PLOT - CADMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



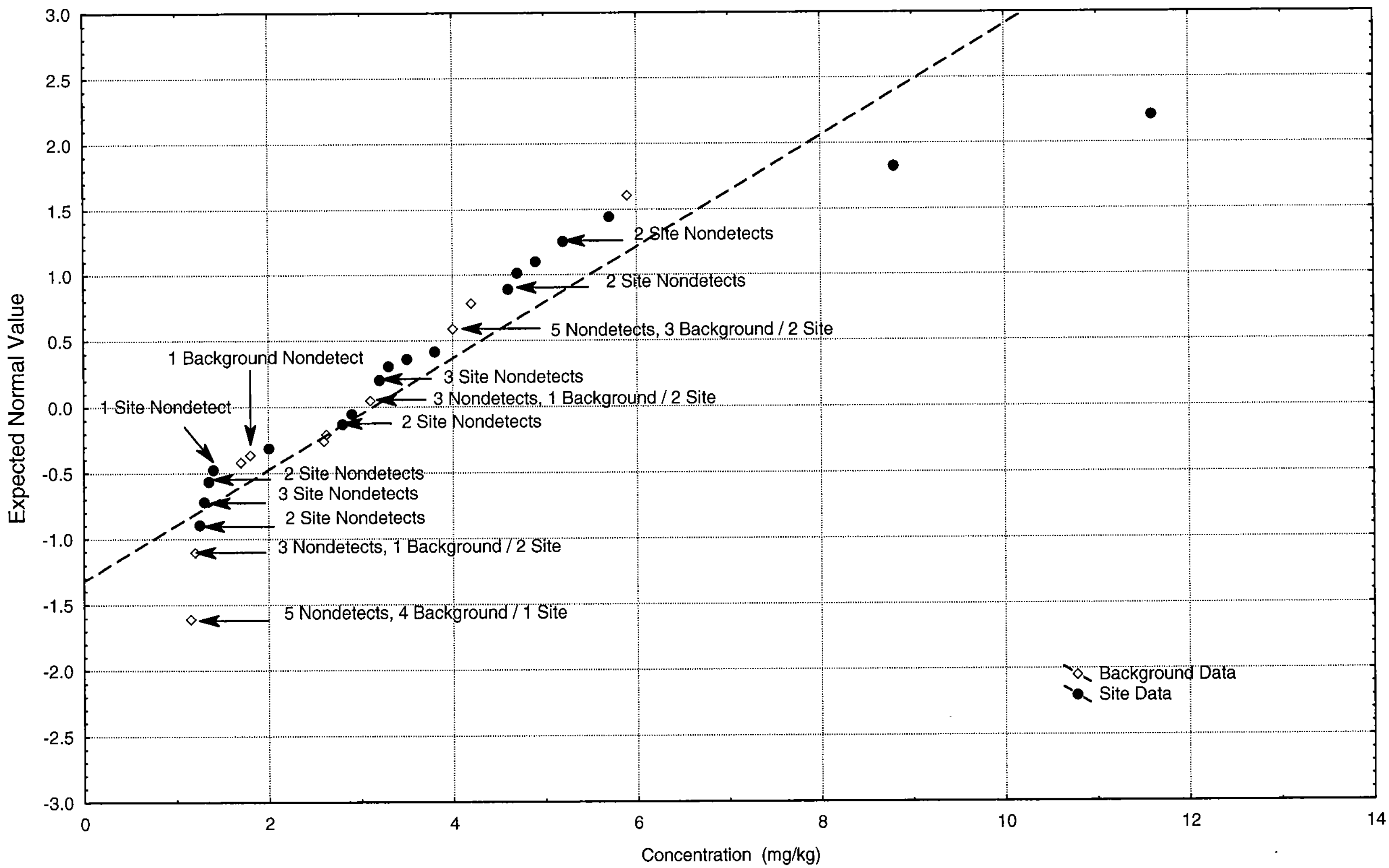
APPENDIX FIGURE A-9-4
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



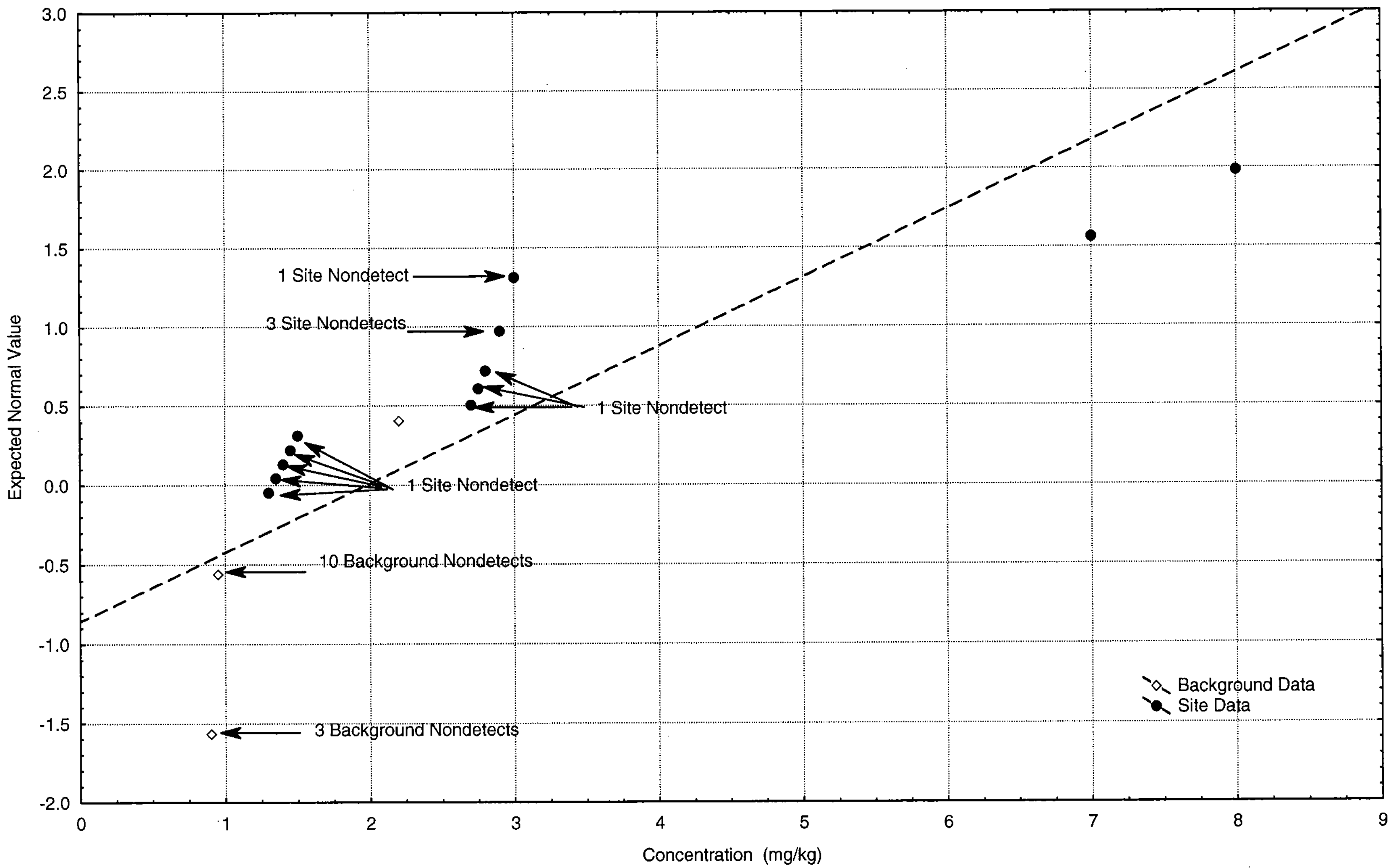
APPENDIX FIGURE A-9-5
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



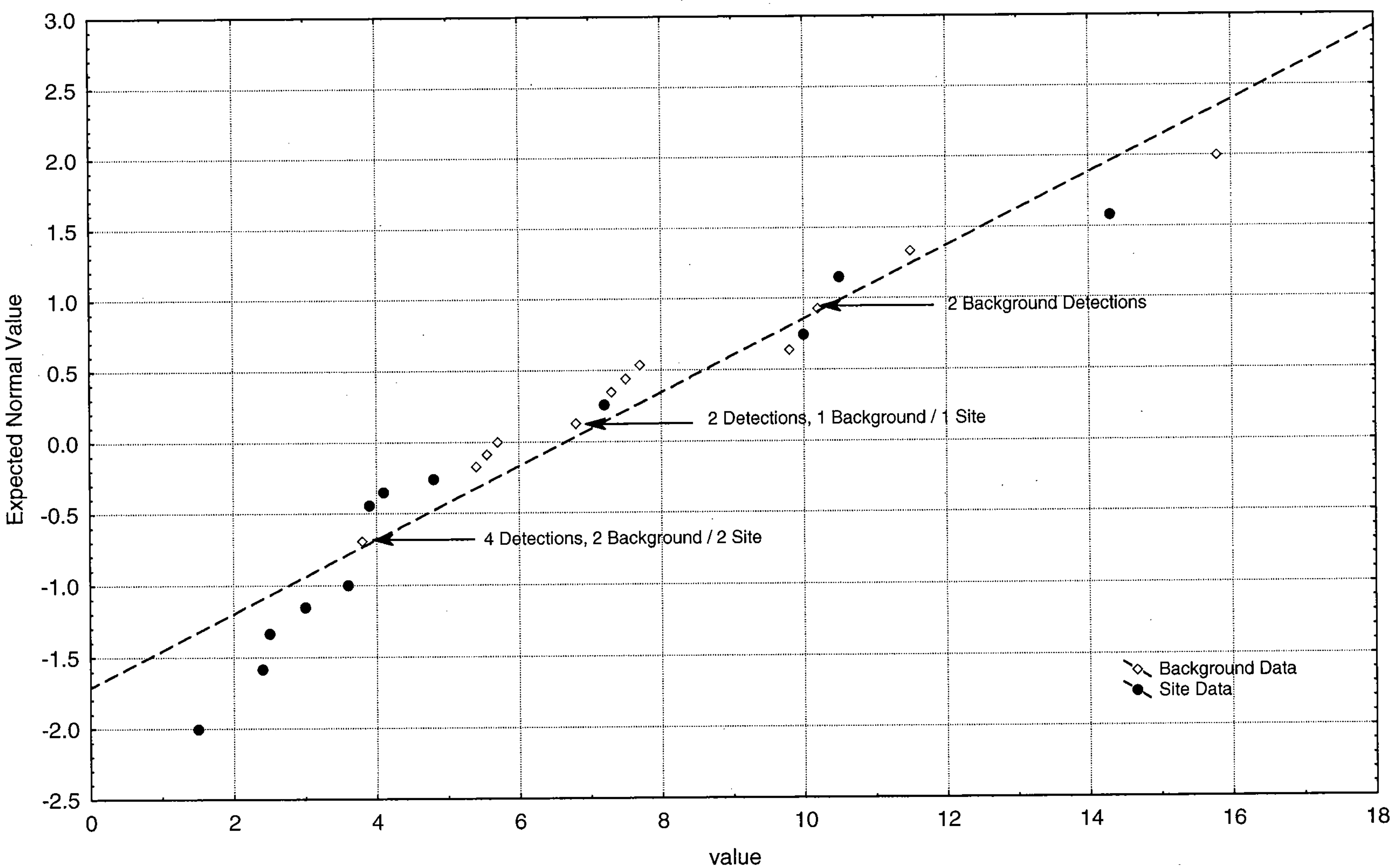
APPENDIX FIGURE A-9-6
NORMAL PROBABILITY PLOT - NICKEL - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



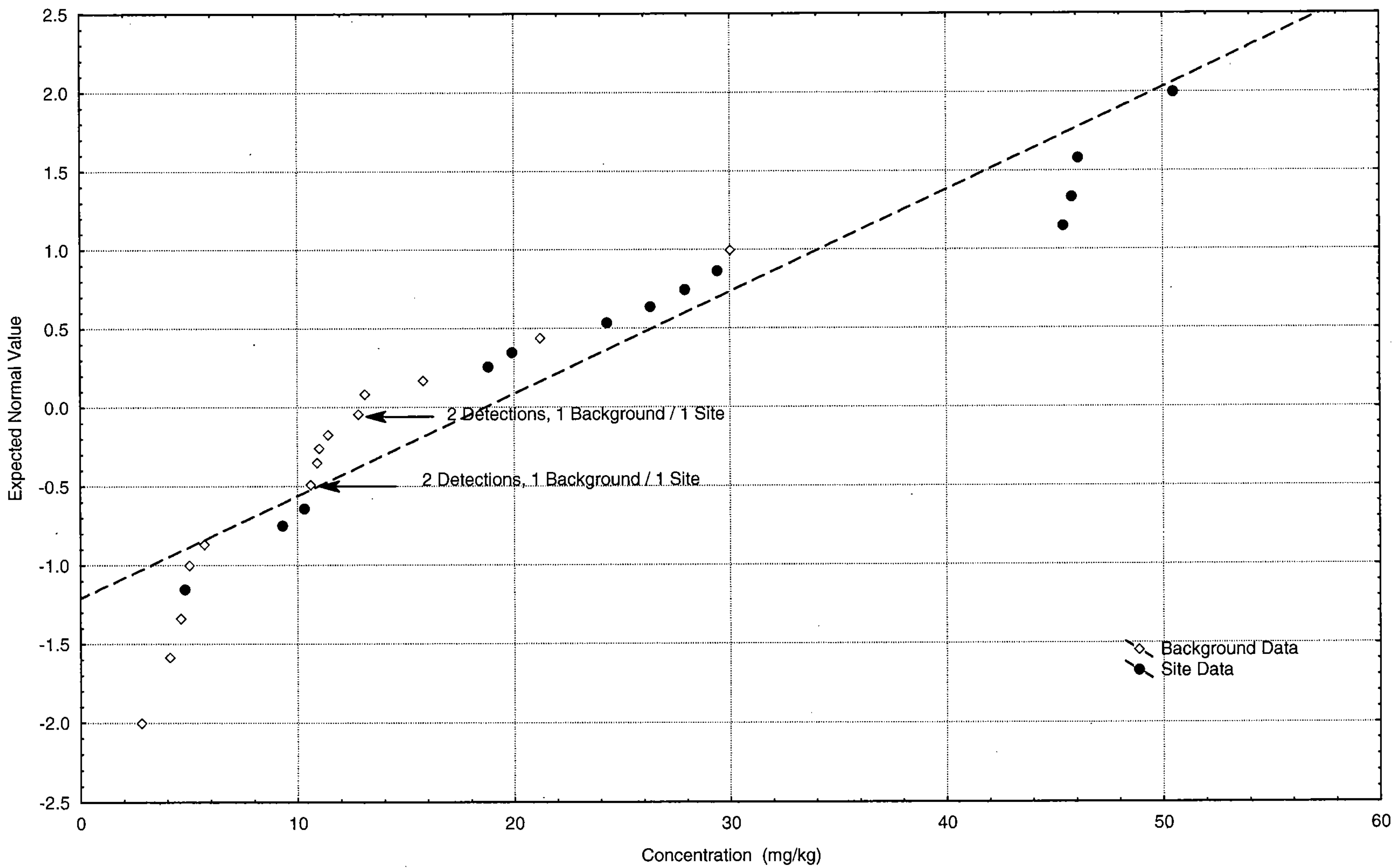
APPENDIX FIGURE A-9-7
NORMAL PROBABILITY PLOT - ANTIMONY - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



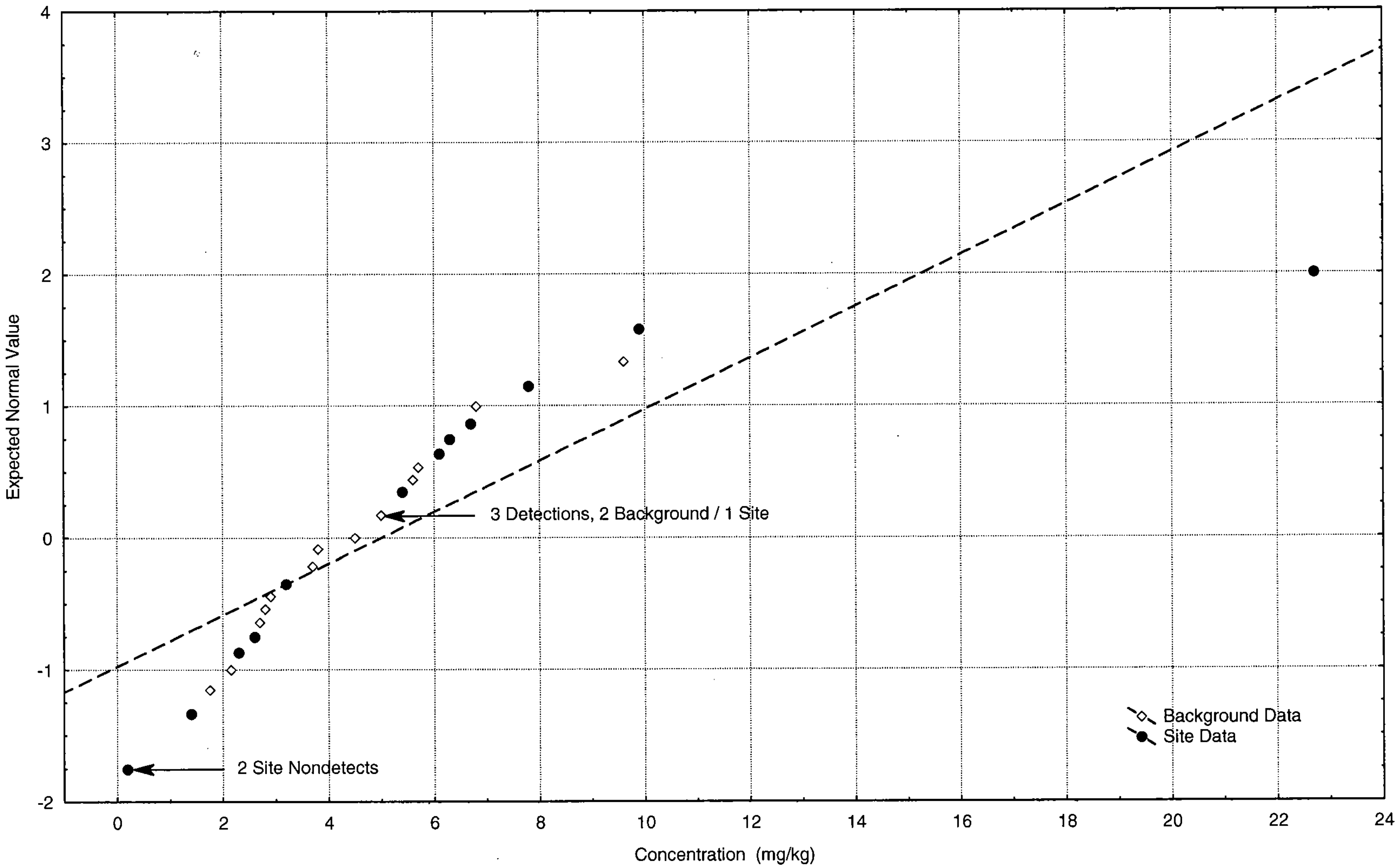
APPENDIX FIGURE A-9-8
NORMAL PROBABILITY PLOT - BARIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-9-9
NORMAL PROBABILITY PLOT - CHROMIUM - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-9-10
NORMAL PROBABILITY PLOT - COPPER - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.10

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL
SITE 18, CRASH CREW TRAINING AREA B

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
2-BUTANONE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	36 J
2-HEXANONE	11 U	11.5 U	12 U	11 U	11 U	63 UJ	11 U	11 U	11 U	11 UJ	61 UJ	53 U
4-METHYL-2-PENTANONE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
ACETONE	19 UJ	15.5 UJ	12 UJ	34 UJ	11 UJ	63 UJ	24 UJ	52 UJ	17 UJ	11 UJ	61 UJ	150 UJ
BENZENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
BROMOFORM	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
BROMOMETHANE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
CARBON DISULFIDE	6	4.5	6 U	4 J	7	32 U	5 U	5 U	6 UJ	5 U	30 U	27 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
CHLOROBENZENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
CHLORODIBROMOMETHANE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
CHLOROETHANE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
CHLOROFORM	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
CHLOROMETHANE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	23 J
METHYLENE CHLORIDE	64 J	37 J	20 UJ	52 UJ	74 J	32 UJ	9 UJ	9 UJ	57 UJ	5 UJ	36 UJ	29 UJ
STYRENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
TOLUENE	6 U	6 U	6 U	9	1 J	32 U	5 U	5 U	6 U	5 U	30 U	10 J
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
TOTAL XYLENES	6 U	6 U	6 U	6 U	5 J	32 U	5 U	5 U	3 J	5 U	30 U	160
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
TRICHLOROETHENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	27 U
VINYL ACETATE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
VINYL CHLORIDE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	53 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
1,2-DICHLOROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
1,3-DICHLOROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
1,4-DICHLOROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	15000 U	15000 U	15000 U	1900 U	1700 U	16000 U	1800 U	8900 U	1800 U	1800 U	9300 U	18000 U
2,4,6-TRICHLOROPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2,4-DICHLOROPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2,4-DIMETHYLPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2,4-DINITROPHENOL	15000 UJ	15000 UJ	15000 UJ	1900 U	1700 U	16000 UJ	1800 U	8900 UJ	1800 UJ	1800 U	9300 U	18000 UJ
2,4-DINITROTOLUENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2,6-DINITROTOLUENE	3000 UJ	3050 UJ	3100 UJ	380 U	350 U	3300 UJ	360 U	1800 U	380 UJ	360 U	1900 U	3700 UJ
2-CHLORONAPHTHALENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2-CHLOROPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2-METHYLNAPHTHALENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	8100	1100 J
2-METHYLPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
2-NITROANILINE	15000 UJ	15000 UJ	15000 UJ	1900 U	1700 U	16000 UJ	1800 U	8900 U	1800 UJ	1800 U	9300 U	18000 UJ
2-NITROPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
3,3'-DICHLOROBENZIDINE	6000 U	6100 U	6200 U	770 U	690 U	6500 U	730 UJ	3700 U	760 U	730 U	3800 U	7500 U
3-NITROANILINE	15000 U	15000 U	15000 U	1900 U	1700 U	16000 U	1800 U	8900 U	1800 U	1800 U	9300 U	18000 U
4,6-DINITRO-2-METHYLPHENOL	15000 U	15000 U	15000 U	1900 U	1700 U	16000 U	1800 U	8900 U	1800 U	1800 U	9300 U	18000 U
4-BROMOPHENYL PHENYL ETHER	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
4-CHLORO-3-METHYLPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
4-CHLOROANILINE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
4-METHYLPHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
4-NITROANILINE	15000 UJ	15000 UJ	15000 UJ	1900 UJ	1700 UJ	16000 UJ	1800 U	8900 U	1800 U	1800 U	9300 U	18000 UJ
4-NITROPHENOL	15000 UJ	15000 UJ	15000 UJ	1900 U	1700 U	16000 UJ	1800 U	8900 U	1800 UJ	1800 U	9300 U	18000 UJ
ACENAPHTHENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
ACENAPHTHYLENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
ANTHRACENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BENZO(A)ANTHRACENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BENZO(A)PYRENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BENZO(B)FLUORANTHENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 UJ	360 U	1900 U	3700 U
BENZO(G,H,I)PERYLENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 UJ	1900 UJ	3700 U
BENZO(K)FLUORANTHENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BENZOIC ACID	15000 U	15000 U	15000 U	1900 U	1700 U	16000 U	1800 UJ	8900 UJ	1800 U	1800 U	9300 U	18000 U
BENZYL ALCOHOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BIS(2-CHLOROETHOXY)METHANE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	440 J	380 U	360 U	1900 U	3700 U
BIS(2-CHLOROETHYL)ETHER	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BIS(2-ETHYLHEXYL)PHTHALATE	700 J	950 J	1200 J	380 UJ	350 UJ	1000 J	360 U	1800 U	56 J	360 U	340 J	3700 U
BUTYL BENZYL PHTHALATE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 U	1800 U	380 UJ	360 U	1900 U	3700 U
CHRYSENE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
DI-N-BUTYL PHTHALATE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 UJ	1800 U	380 U	360 UJ	1900 U	3700 U
DI-N-OCTYL PHTHALATE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
DIBENZO(A,H)ANTHRACENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 UJ	1900 UJ	3700 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
DIETHYL PHTHALATE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
DIMETHYL PHTHALATE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
FLUORANTHENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
FLUORENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 UJ	1900 UJ	3700 U
HEXACHLOROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
HEXACHLOROBUTADIENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
HEXACHLOROCYCLOPENTADIENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
HEXACHLOROETHANE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
INDENO(1,2,3-CD)PYRENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 UJ	1900 UJ	3700 U
ISOPHORONE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
N-NITROSO-DI-N-PROPYLAMINE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
N-NITROSODIPHENYLAMINE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
NAPHTHALENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	2200	3700 U
NITROBENZENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
PENTACHLOROPHENOL	15000 U	15000 U	15000 U	1900 U	1700 U	16000 U	1800 U	8900 U	1800 U	1800 U	9300 U	18000 U
PHENANTHRENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
PHENOL	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
PYRENE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
Pesticides PCBs (ug/kg)												
4,4'-DDD	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
4,4'-DDE	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
4,4'-DDT	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
ALDRIN	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
ALPHA-BHC	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
ALPHA-CHLORDANE	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1016	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1221	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1232	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1242	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1248	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
AROCLOR-1254	910 U	925 U	940 U					360 U	180 U	180 U	190 U	910 U
AROCLOR-1260	910 U	925 U	940 U					360 U	180 U	180 U	190 U	910 U
BETA-BHC	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
DELTA-BHC	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
DIELDRIN	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
ENDOSULFAN I	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
ENDOSULFAN II	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
ENDOSULFAN SULFATE	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
ENDRIN	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	91 U	92.5 U	94 U					36 U	18 U	18 U	19 U	91 U
GAMMA-BHC (LINDANE)	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
GAMMA-CHLORDANE	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
HEPTACHLOR	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
HEPTACHLOR EPOXIDE	45 U	46 U	47 U					18 U	9.2 U	8.8 U	9.3 U	45 U
METHOXYCHLOR	450 U	460 U	470 U					180 U	92 U	88 U	93 U	450 U
TOXAPHENE	910 U	925 U	940 U					360 U	180 U	180 U	190 U	910 U
Inorganics (mg/kg)												
ALUMINUM	3850	4215	4580	3140	3100	4550	3260	3140	6530	3380	2880	3000
ANTIMONY	2.9 UJ	3.625 J	5.8 J	4.4 U	2.6 U	3.3 U	2.7 U	2.7 U	2.8 U	2.7 U	2.8 U	2.9
ARSENIC	0.55 UJ	0.825 UJ	1.1 UJ	0.59 J	0.77 J	0.72 J	0.26 J	0.22 U	0.64 J	0.46 J	1.1 J	0.9 UJ
BARIUM	17.2 J	31.2 J	45.2 J	7.1 J	5.5 J	27.2 J	6.5 J	10.6 J	38.6 J	5.7 J	32.4 J	97.7
BERYLLIUM	0.06 U	0.06 U	0.06 U	0.09 U	0.05 U	0.06 U	0.05 U	0.05 U	0.06 U	0.06 J	0.05 U	0.06 U
CADMIUM	22.6 J	28.15 J	33.7 J	2.8	0.58 U	9	0.6 U	9.3	20.6	0.88 J	0.61 U	0.63 UJ
CALCIUM	207 UJ	187 UJ	167 UJ	197 J	151 J	296 J	91.3 J	151 J	153 J	107 J	115 J	310 UJ
CHROMIUM	16.5 J	25.4 J	34.3 J	5.4	2.9	8.3	4	10.7	39.8	3.6	3.6	95.7 J
COBALT	0.37 UJ	0.835 UJ	1.3 UJ	1.3 J	1 J	0.87 J	0.78 J	0.47 J	0.35 U	0.34 U	0.76 J	4.3 UJ
COPPER	177	520.5	864	8.4 J	1.8 J	32.6	6.8	45.3	201	8	13.9	65.3 J
IRON	1710	2145	2580	1800	1700	2180	1790	1490	1990	1690	7050	35600 J
LEAD	62.6	79.35 J	96.1 J	28.9 J	6.7 J	35.6	5.1	32.6	76.5	32.3	55.4 J	57.4
MAGNESIUM	94.7 J	98.85 J	103 J	94.9 J	116 J	126 J	84.1 J	125 J	133 J	81.8 J	116 J	237 J
MANGANESE	18.3 J	20.45 J	22.6 J	24.1	102	27.8	18.5	16	38.2	27.7	52.6	317 J
MERCURY	0.08 U	0.08 U	0.08 U	0.12 U	0.07 U	0.09 U	0.01 U	0.01 U	0.08 U	0.07 U	0.08 U	0.04 J
NICKEL	2.5 U	8.575	15.9	3.8 U	2.6 J	2.8 U	2.4 U	2.4 U	2.5 J	2.3 U	3.7 J	18.9 J
POTASSIUM	141 U	143.25 J	216 J	280 J	293 J	158 U	199 J	194 J	137 U	132 U	175 J	276 J
SELENIUM	0.44 UJ	0.435 UJ	0.43 UJ	0.66 U	0.39 U	0.49 U	0.46 U	0.46 U	0.47 U	0.46 U	0.47 U	0.48 U
SILVER	0.35 U	0.525 UJ	0.7 UJ	0.53 U	0.35 J	0.39 U	0.33 U	0.33 U	0.34 U	0.33 U	0.33 U	0.34 UJ
SODIUM	176 UJ	203 UJ	230 UJ	279 J	164 J	220 J	182 J	155 J	163 J	171 J	196 J	210 UJ
THALLIUM	0.48 U	0.48 U	0.48 U	0.73 U	0.43 U	0.54 U	0.35 U	0.35 U	0.47 U	0.45 U	0.46 U	0.37 UJ
VANADIUM	3.5 UJ	3.55 UJ	3.6 UJ	4.4 J	4.5 J	5.4 J	4.6 J	4.2 J	3.4 J	4.4 J	3.3 J	3.8 J
ZINC	94.2 J	134.1 J	174 J	10.5 J	4.9 J	50.3 J	9.1 J	38.9	200	9.4	32.7 J	181 J
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.26 U	0.26 U	0.26 U	0.39 U	0.23 U	0.29 U	0.24 U	0.24 U	0.25 U	0.25 U	0.25 U	0.26 U
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	9020	10710	12400	195	1.7 U	13300	16.7	7410	87.4	4.6	120	6210

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
1,1,2,2-TETRACHLOROETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 UJ	6 UJ	6 U
1,1,2-TRICHLOROETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
1,1-DICHLOROETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
1,1-DICHLOROETHENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
1,2-DICHLOROETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
1,2-DICHLOROPROPANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
2-BUTANONE	35.5 J	35 J	11 U	12 U	30 J	11 U	55 U	36 J	17 J	12 U	12 U	12 U
2-HEXANONE	53.5 U	54 U	11 UJ	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
4-METHYL-2-PENTANONE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
ACETONE	165 UJ	180 UJ	15 UJ	32 UJ	150 UJ	34 UJ	230 UJ	160 UJ	84 UJ	20 UJ	39 UJ	71 UJ
BENZENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
BROMODICHLOROMETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
BROMOFORM	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
BROMOMETHANE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
CARBON DISULFIDE	27 U	27 U	5 U	6 UJ	27 U	5 U	27 UJ	27 U	14 U	6 U	6 UJ	6 U
CARBON TETRACHLORIDE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
CHLOROBENZENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
CHLORODIBROMOMETHANE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
CHLOROETHANE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
CHLOROFORM	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
CHLOROMETHANE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
ETHYLBENZENE	46.5 J	70	5 U	6 U	27 U	5 U	120	15 J	14 U	6 U	6 U	6 U
METHYLENE CHLORIDE	38 UJ	47 UJ	7 UJ	49 UJ	47 UJ	23 UJ	100 UJ	57 UJ	46 UJ	9 UJ	29 UJ	17 UJ
STYRENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
TETRACHLOROETHENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
TOLUENE	19 J	28	5 U	6 U	14 J	5 U	34	27 U	14 U	6 U	6 U	6 U
TOTAL 1,2-DICHLOROETHENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
TOTAL XYLENES	295	430	2 J	6 U	67	3 J	1000	76	14 U	6 U	3 J	4 J
TRANS-1,3-DICHLOROPROPENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
TRICHLOROETHENE	27 U	27 U	5 U	6 U	27 U	5 U	27 U	27 U	14 U	6 U	6 U	6 U
VINYL ACETATE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
VINYL CHLORIDE	53.5 U	54 U	11 U	12 U	54 U	11 U	55 U	54 U	27 U	12 U	12 U	12 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
1,2-DICHLOROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
1,3-DICHLOROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
1,4-DICHLOROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	18000 U	18000 U	1800 U	1800 U	1700 U	1700 U	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
2,4,6-TRICHLOROPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2,4-DICHLOROPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2,4-DIMETHYLPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2,4-DINITROPHENOL	18000 UJ	18000 UJ	1800 UJ	1800 UJ	1700 UJ	1700 UJ	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 UJ
2,4-DINITROTOLUENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2,6-DINITROTOLUENE	3700 UJ	3700 UJ	360 UJ	360 UJ	350 UJ	360 UJ	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 UJ
2-CHLORONAPHTHALENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2-CHLOROPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2-METHYLNAPHTHALENE	1100 J	3700 U	360 U	360 U	350 U	360 U	11000 J	15000 J	1900 U	3800 U	1900 U	380 U
2-METHYLPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
2-NITROANILINE	18000 UJ	18000 UJ	1800 UJ	1800 UJ	1700 UJ	1700 UJ	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 UJ
2-NITROPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
3,3'-DICHLOROBENZIDINE	7450 U	7400 U	730 U	730 U	710 U	720 U	15000 UJ	18000 UJ	3700 U	7700 U	3800 U	770 U
3-NITROANILINE	18000 U	18000 U	1800 U	1800 U	1700 U	1700 U	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
4,6-DINITRO-2-METHYLPHENOL	18000 U	18000 U	1800 U	1800 U	1700 U	1700 U	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
4-BROMOPHENYL PHENYL ETHER	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
4-CHLORO-3-METHYLPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
4-CHLOROANILINE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
4-METHYLPHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
4-NITROANILINE	18000 UJ	18000 UJ	1800 U	1800 UJ	1700 UJ	1700 UJ	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
4-NITROPHENOL	18000 UJ	18000 UJ	1800 UJ	1800 UJ	1700 UJ	1700 UJ	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 UJ
ACENAPHTHENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
ACENAPHTHYLENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
ANTHRACENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BENZO(A)ANTHRACENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BENZO(A)PYRENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BENZO(B)FLUORANTHENE	3700 U	3700 U	360 UJ	360 UJ	350 UJ	360 UJ	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 UJ
BENZO(G,H,I)PERYLENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 UJ	3800 UJ	1900 UJ	380 U
BENZO(K)FLUORANTHENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BENZOIC ACID	18000 U	18000 U	1800 U	1800 U	1700 U	1700 U	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
BENZYL ALCOHOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BIS(2-CHLOROETHOXY)METHANE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BIS(2-CHLOROETHYL)ETHER	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	3700 U	3700 U	110 J	360 U	76 J	360 U	7300 UJ	8900 UJ	320 J	3800 U	1900 U	380 U
BUTYL BENZYL PHTHALATE	3700 U	3700 U	360 UJ	360 UJ	350 UJ	360 UJ	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
CHRYSENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
DI-N-BUTYL PHTHALATE	3700 U	3700 U	360 UJ	360 UJ	350 U	360 UJ	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
DI-N-OCTYL PHTHALATE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
DIBENZO(A,H)ANTHRACENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 UJ	3800 UJ	1900 UJ	380 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
DIETHYL PHTHALATE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
DIMETHYL PHTHALATE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
FLUORANTHENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
FLUORENE	3700 U	3700 U	360 U	360 U	440	360 U	7300 UJ	8900 UJ	1900 UJ	3800 UJ	1900 UJ	380 UJ
HEXACHLOROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
HEXACHLOROBUTADIENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
HEXACHLOROCYCLOPENTADIENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
HEXACHLOROETHANE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
INDENO(1,2,3-CD)PYRENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 UJ	3800 UJ	1900 UJ	380 U
ISOPHORONE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
N-NITROSODIPHENYLAMINE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
NAPHTHALENE	3700 U	3700 U	360 U	360 U	990	360 U	3000 J	3500 J	1900 U	3800 U	1900 U	380 U
NITROBENZENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
PENTACHLOROPHENOL	18000 U	18000 U	1800 U	1800 U	1700 U	1700 U	35000 UJ	43000 UJ	9000 U	19000 U	9200 U	1900 U
PHENANTHRENE	3700 U	3700 U	360 U	360 U	120 J	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
PHENOL	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
PYRENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 UJ
Pesticides PCBs (ug/kg)												
4,4'-DDD	90.5 U	90 U										
4,4'-DDE	90.5 U	90 U										
4,4'-DDT	90.5 U	90 U										
ALDRIN	45 U	45 U										
ALPHA-BHC	45 U	45 U										
ALPHA-CHLORDANE	450 U	450 U										
AROCLOR-1016	450 U	450 U										
AROCLOR-1221	450 U	450 U										
AROCLOR-1232	450 U	450 U										
AROCLOR-1242	450 U	450 U										
AROCLOR-1248	450 U	450 U										
AROCLOR-1254	905 U	900 U										
AROCLOR-1260	905 U	900 U										
BETA-BHC	45 U	45 U										
DELTA-BHC	45 U	45 U										
DIELDRIN	90.5 U	90 U										
ENDOSULFAN I	45 U	45 U										
ENDOSULFAN II	90.5 U	90 U										
ENDOSULFAN SULFATE	90.5 U	90 U										
ENDRIN	90.5 U	90 U										

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	90.5 U	90 U										
GAMMA-BHC (LINDANE)	45 U	45 U										
GAMMA-CHLORDANE	450 U	450 U										
HEPTACHLOR	45 U	45 U										
HEPTACHLOR EPOXIDE	45 U	45 U										
METHOXYCHLOR	450 U	450 U										
TOXAPHENE	905 U	900 U										
Inorganics (mg/kg)												
ALUMINUM	2760 J	2520 J	3240	2480	3990	4880	4240	3910	2260	3780	2300	4690
ANTIMONY	2.125 J	2.7 UJ	2.8 U	2.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.8 U	2.9 U
ARSENIC	1.55 UJ	2.2 UJ	0.53 J	0.52 J	0.66 J	0.78 J	0.56 J	0.53 J	0.36 J	0.73 J	0.67 J	1 J
BARIUM	95	92.3	14.1 J	4.3 J	5.7 J	6 J	10.9 J	7.2 J	25 J	31.4 J	24 J	9.2 J
BERYLLIUM	0.06 J	0.09 J	0.06 U	0.05 U	0.05 U	0.07 J	0.05 U	0.05 U	0.05 U	0.06 J	0.09 J	0.08 J
CADMIUM	0.5075 J	0.7 J	0.81 J	0.62 U	0.59 U	0.99 J	0.6 U	0.59 U	0.6 U	1.2	2.5	0.63 U
CALCIUM	316 UJ	322 UJ	160 J	112 J	93 J	80.1 J	96.9 J	151 J	96.6 J	181 J	353 J	1050 J
CHROMIUM	52.95 J	10.2 J	4.5	1.5 J	5.4	3.1	8.6	3.8	2.4 J	15.5	5	3.5
COBALT	3.25 UJ	2.2 UJ	0.45 J	0.35 U	0.34 U	0.81 J	0.4 J	0.4 J	0.34 U	1.8 J	1.3 J	1.4 J
COPPER	45.1 J	24.9 J	6.5	2.4 J	3.2 J	3.5 J	3 J	8.7	3.8 J	9.5	10.3	3 J
IRON	24850 J	14100 J	1760	1600	2240	2810	2870	2060	1750	4190	1900	3340
LEAD	72.95	88.5	60 J	3.2 J	29.6	3.4 J	54.5 J	19	20	48.7	57.9	11.5
MAGNESIUM	211 J	185 J	92.4 J	63.4 J	122 J	88.7 J	106 J	137 J	53.4 J	94.6 J	78.5 J	87.6 J
MANGANESE	220.5 J	124 J	13.8	68.8	21.3	79.3	19.3	22.9	15.1	20.8	35.2	47.8
MERCURY	0.05 J	0.06 J	0.08 U	0.08 U	0.07 U	0.08 U	0.07 U	0.08 U	0.09 U	0.07 J	0.06 J	0.06 J
NICKEL	12.15 J	5.4 J	3.4 J	2.4 U	2.9 J	3.9 J	2.3 U	7 J	3.1 J	2.6 J	2.4 U	3.3 J
POTASSIUM	268.5 J	261 J	318 J	145 J	247 J	346 J	301 J	297 J	166 J	181 J	198 J	139 U
SELENIUM	0.47 UJ	0.46 UJ	0.47 U	0.47 U	0.45 U	0.46 U	0.46 U	0.45 U	0.46 U	0.47 U	0.47 U	0.48 U
SILVER	0.335 UJ	0.33 UJ	0.34 U	0.33 U	0.32 U	0.33 U	0.32 U	0.32 U	0.33 U	0.33 UJ	0.33 UJ	0.34 UJ
SODIUM	189.5 UJ	169 UJ	182 J	169 J	164 J	179 J	195 J	213 J	216 J	155 J	137 J	150 J
THALLIUM	0.36 UJ	0.35 UJ	0.46 U	0.46 U	0.44 U	0.45 U	0.45 U	0.44 U	0.45 U	0.36 U	0.36 U	0.37 U
VANADIUM	3.35 J	2.9	4 J	3.4 J	5 J	6.4 J	6.2 J	4.7 J	3 J	8.4 J	2.9 J	8 J
ZINC	140.15 J	99.3 J	21.2 J	4.3 J	9.4 J	8.9 J	9.1 J	27.5 J	17.6 J	16.5 J	28.6 J	21.3 J
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.25 U	0.24 U	0.25 U	0.25 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.25 U	0.25 U	0.26 U
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	5515	4820	56.6	1.8 U	55.7	1.8 U	23500	10600	7040	1350	389	1.9 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	27 UJ	6 UJ	680 UJ	6 UJ	30 UJ	27 UJ
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	27 U	6 U	680 U	6 U	30 U	27 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	27 U	6 U	680 U	6 U	30 U	27 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	27 U	6 U	680 U	6 U	30 U	27 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
2-BUTANONE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1700	11 U	61 U	55 U
2-HEXANONE	12 U	13 U	12 UJ	11.5 UJ	11 UJ	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
4-METHYL-2-PENTANONE	12 U	13 U	12 UJ	11.5 UJ	11 UJ	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
ACETONE	200 UJ	180 UJ	12 UJ	13 UJ	14 UJ	43 UJ	250 UJ	110 UJ	1400 UJ	19 UJ	82 UJ	55 UJ
BENZENE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
BROMOFORM	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
BROMOMETHANE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
CARBON DISULFIDE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 UJ	27 UJ	6 UJ	680 U	6 U	30 UJ	27 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
CHLOROBENZENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
CHLORODIBROMOMETHANE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
CHLOROETHANE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
CHLOROFORM	6 U	6 U	6 U	6 U	6 U	6 U	27 U	6 U	680 U	6 U	30 U	27 U
CHLOROMETHANE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
ETHYLBENZENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	190	6 U	430 J	6 U	30 U	27 U
METHYLENE CHLORIDE	12 UJ	25 UJ	32 UJ	44 UJ	56 UJ	34 UJ	57 UJ	24 UJ	680 UJ	10 UJ	85 UJ	38 UJ
STYRENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
TETRACHLOROETHENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
TOLUENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	47	6 U	190 J	6 U	30 U	27 U
TOTAL 1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	27 U	6 U	680 U	6 U	30 U	27 U
TOTAL XYLENES	4 J	2 J	6 UJ	2 J	2 J	6 U	670	1 J	3300	1 J	30 U	12 J
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
TRICHLOROETHENE	6 U	6 U	6 U	6 UJ	6 UJ	6 U	27 U	6 U	680 U	6 U	30 U	27 U
VINYL ACETATE	12 U	13 U	12 U	11.5 UJ	11 UJ	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
VINYL CHLORIDE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1400 U	11 U	61 U	55 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
1,2-DICHLOROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
1,3-DICHLOROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
1,4-DICHLOROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA
PAGE 10 OF 20

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1900 U	1900 U	46000 UJ	46000 UJ	46000 UJ	1800 U	26000 U	1800 U	43000 UJ	1800 U	20000 U	7400 U
2,4,6-TRICHLOROPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2,4-DICHLOROPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2,4-DIMETHYLPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2,4-DINITROPHENOL	1900 UJ	1900 UJ	46000 UJ	46000 UJ	46000 UJ	1800 UJ	26000 U	1800 UJ	43000 UJ	1800 UJ	20000 U	7400 U
2,4-DINITROTOLUENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2,6-DINITROTOLUENE	390 UJ	390 UJ	9500 UJ	9500 UJ	9500 UJ	370 UJ	5400 U	370 UJ	8900 UJ	360 UJ	4000 U	1500 U
2-CHLORONAPHTHALENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2-CHLOROPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2-METHYLNAPHTHALENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	14000	370 U	33000 J	360 U	4000 U	1500 U
2-METHYLPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
2-NITROANILINE	1900 UJ	1900 UJ	46000 UJ	46000 UJ	46000 UJ	1800 UJ	26000 U	1800 UJ	43000 UJ	1800 UJ	20000 U	7400 U
2-NITROPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
3,3'-DICHLOROBENZIDINE	790 U	790 U	19000 UJ	19000 UJ	19000 UJ	750 U	11000 U	750 U	18000 UJ	730 U	8100 U	3100 U
3-NITROANILINE	1900 U	1900 U	46000 UJ	46000 UJ	46000 UJ	1800 U	26000 U	1800 U	43000 UJ	1800 U	20000 U	7400 U
4,6-DINITRO-2-METHYLPHENOL	1900 U	1900 U	46000 UJ	46000 UJ	46000 UJ	1800 U	26000 U	1800 U	43000 UJ	1800 U	20000 U	7400 U
4-BROMOPHENYL PHENYL ETHER	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
4-CHLORO-3-METHYLPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
4-CHLOROANILINE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
4-METHYLPHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
4-NITROANILINE	1900 UJ	1900 UJ	46000 UJ	46000 UJ	46000 UJ	1800 UJ	26000 U	1800 U	43000 UJ	1800 UJ	20000 U	7400 U
4-NITROPHENOL	1900 UJ	1900 UJ	46000 UJ	46000 UJ	46000 UJ	1800 UJ	26000 U	1800 UJ	43000 UJ	1800 UJ	20000 U	7400 U
ACENAPHTHENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
ACENAPHTHYLENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
ANTHRACENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BENZO(A)ANTHRACENE	390 U	390 U	1300 J	1300 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BENZO(A)PYRENE	390 U	390 U	1200 J	1200 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BENZO(B)FLUORANTHENE	390 UJ	390 UJ	9500 UJ	9500 UJ	9500 UJ	370 UJ	5400 U	370 UJ	8900 UJ	360 UJ	4000 U	1500 U
BENZO(G,H,I)PERYLENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 UJ	370 U	8900 UJ	360 U	4000 UJ	1500 UJ
BENZO(K)FLUORANTHENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BENZOIC ACID	1900 U	1900 U	46000 UJ	46000 UJ	46000 UJ	1800 U	26000 U	1800 U	43000 UJ	1800 U	20000 U	7400 U
BENZYL ALCOHOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BIS(2-CHLOROETHOXY)METHANE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BIS(2-CHLOROETHYL)ETHER	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	390 U	5600 J	4850 J	4100 J	68 J	5400 U	370 U	8900 UJ	360 U	790 J	600 J
BUTYL BENZYL PHTHALATE	390 UJ	390 UJ	9500 UJ	9500 UJ	9500 UJ	370 UJ	5400 U	370 UJ	8900 UJ	360 UJ	4000 U	1500 U
CHRYSENE	390 U	390 U	1400 J	1400 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
DI-N-BUTYL PHTHALATE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 UJ	5400 U	370 UJ	8900 UJ	360 U	4000 U	1500 U
DI-N-OCTYL PHTHALATE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
DIBENZO(A,H)ANTHRACENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 UJ	370 U	8900 UJ	360 U	4000 UJ	1500 UJ

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
DIETHYL PHTHALATE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
DIMETHYL PHTHALATE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
FLUORANTHENE	390 U	390 U	3500 J	3500 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
FLUORENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 UJ	370 U	8900 UJ	360 U	4000 UJ	1500 UJ
HEXACHLOROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
HEXACHLOROBUTADIENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
HEXACHLOROCYCLOPENTADIENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
HEXACHLOROETHANE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
INDENO(1,2,3-CD)PYRENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 UJ	370 U	8900 UJ	360 U	4000 UJ	1500 UJ
ISOPHORONE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
N-NITROSO-DI-N-PROPYLAMINE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
N-NITROSODIPHENYLAMINE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
NAPHTHALENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	4100 J	370 U	7500 J	360 U	4000 U	1500 U
NITROBENZENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
PENTACHLOROPHENOL	1900 U	1900 U	46000 UJ	46000 UJ	46000 UJ	1800 U	26000 U	1800 U	43000 UJ	1800 U	20000 U	7400 U
PHENANTHRENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	730 J	370 U	2200 J	360 U	4000 U	1500 U
PHENOL	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
PYRENE	390 U	390 U	7700 J	6950 J	6200 J	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
Pesticides PCBs (ug/kg)												
4,4'-DDD			740 UJ	740 UJ	740 UJ		70 U					
4,4'-DDE			740 UJ	740 UJ	740 UJ		70 U					
4,4'-DDT			740 UJ	740 UJ	740 UJ		70 U					
ALDRIN			370 UJ	370 UJ	370 UJ		35 U					
ALPHA-BHC			370 UJ	370 UJ	370 UJ		35 U					
ALPHA-CHLORDANE			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1016			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1221			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1232			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1242			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1248			3700 UJ	3700 UJ	3700 UJ		350 U					
AROCLOR-1254			7400 UJ	7400 UJ	7400 UJ		700 U					
AROCLOR-1260			7400 UJ	7400 UJ	7400 UJ		700 U					
BETA-BHC			370 UJ	370 UJ	370 UJ		35 U					
DELTA-BHC			370 UJ	370 UJ	370 UJ		35 U					
DIELDRIN			740 UJ	740 UJ	740 UJ		70 U					
ENDOSULFAN I			370 UJ	370 UJ	370 UJ		35 U					
ENDOSULFAN II			740 UJ	740 UJ	740 UJ		70 U					
ENDOSULFAN SULFATE			740 UJ	740 UJ	740 UJ		70 U					
ENDRIN			740 UJ	740 UJ	740 UJ		70 U					

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE			740 UJ	740 UJ	740 UJ		70 U					
GAMMA-BHC (LINDANE)			370 UJ	370 UJ	370 UJ		35 U					
GAMMA-CHLORDANE			3700 UJ	3700 UJ	3700 UJ		350 U					
HEPTACHLOR			370 UJ	370 UJ	370 UJ		35 U					
HEPTACHLOR EPOXIDE			370 UJ	370 UJ	370 UJ		35 U					
METHOXYCHLOR			3700 UJ	3700 UJ	3700 UJ		350 U					
TOXAPHENE			7400 UJ	7400 UJ	7400 UJ		700 U					
Inorganics (mg/kg)												
ALUMINUM	1510	1990	13200 J	9085 J	4970 J	3480	3790	2310	4100	1730	2910	3330
ANTIMONY	3 U	3 U	2.9 UJ	2.475 J	3.5 J	2.8 U	2.7 U	2.9 U	2.7 U	2.7 U	3.1 U	2.8 U
ARSENIC	0.37 J	0.51 J	1 UJ	1.3 UJ	1.6 UJ	0.63 J	0.58 J	0.56 J	0.71 J	0.24 J	0.81 J	0.74 J
BARIUM	4.8 J	3.4 J	198	193	188	6.9 J	5.2 J	28.8 J	4.7 J	6.8 J	46.2 J	13.4 J
BERYLLIUM	0.11 J	0.06 U	0.09 J	0.085 J	0.08 J	0.06 U	0.08 J	0.1 J	0.08 J	0.05 U	0.06 U	0.09 J
CADMIUM	0.67 U	1 J	5.5	5.25 J	5 J	0.63 U	0.6 J	1.2 J	0.59 U	0.6 U	0.91 J	0.63 U
CALCIUM	367 J	189 J	786 UJ	670.5 UJ	555 UJ	185 J	211 J	100 J	75.2 J	63 J	148 J	167 J
CHROMIUM	3.1	3.4	33.9	28.65 J	23.4 J	8.7	3.6	5.6	3.6	1.8 J	6.6	2.6
COBALT	0.77 J	1.1 J	2.3 UJ	2.6 UJ	2.9 UJ	1.8 J	1.9 J	1.1 J	1.4 J	0.34 U	2 J	0.36 U
COPPER	7.5 J	7.3 J	236 J	152.3 J	68.6 J	14.5	5.2 J	6.9 J	6.4 J	5.6 J	27.5	7.2 J
IRON	1140	1520	12900	18200 J	23500 J	2070	2500	1530	2350	1490	3200	1790
LEAD	8.4	10.4	59.6	61.4	63.2	24.5	19.1	16.8	35.1	3.2	32.1	22.2
MAGNESIUM	67.3 J	33.8 J	455 J	361 J	267 J	90 J	93.2 J	65.4 J	106 J	35.6 J	136 J	83.4 J
MANGANESE	18	15.1	131	136 J	141 J	12.2	134	45.8	21.7	39.6	35.4	45
MERCURY	0.09 J	0.08 J	0.25	0.16 J	0.07 J	0.09 J	0.06 J	0.05 J	0.08 J	0.19	0.08 J	0.07 J
NICKEL	2.6 J	2.6 J	6.5 J	6.6 J	6.7 J	2.5 U	2.3 U	4.5 J	2.3 U	2.3 U	7.2 J	2.5 J
POTASSIUM	147 U	149 J	1210	1135 J	1060 J	138 U	301 J	260 J	259 J	132 U	359 J	168 J
SELENIUM	0.51 U	0.5 U	0.49 UJ	0.485 UJ	0.48 U	0.48 U	0.45 U	0.49 U	0.45 U	0.46 U	0.52 U	0.48 U
SILVER	0.36 UJ	0.36 UJ	0.35 UJ	0.345 UJ	0.34 UJ	0.34 UJ	0.32 UJ	0.35 UJ	0.32 UJ	0.33 UJ	0.37 UJ	0.34 UJ
SODIUM	232 J	201 J	226 UJ	219 UJ	212 UJ	173 J	190 J	231 J	169 J	137 J	203 J	156 J
THALLIUM	0.39 U	0.38 U	0.37 UJ	0.365 UJ	0.36 UJ	0.36 U	0.34 U	0.37 U	0.34 U	0.35 U	0.39 U	0.36 U
VANADIUM	2.6 J	4 J	4.3 J	4.05 J	3.8 J	5 J	5.4 J	3.7 J	5.4 J	2.4 J	3.3 J	4.4 J
ZINC	10.1 J	9.8 J	631 J	420.5 J	210 J	11.7 J	7 J	27.9 J	5.5 J	11 J	57.7 J	9.8 J
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.27 U	0.27 U	0.26 U	0.26 U	0.26 U	0.26 U	0.23 U	0.26 U	0.23 U	0.24 U	0.27 U	0.26 U
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	2.9	54.8	18800	18300	17800	113	9950	58.6	20500	1.8 U	8770	2170

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
1,1,2,2-TETRACHLOROETHANE	710 UJ	369 UJ	28 U	29 U	740 UJ	690 UJ	29 U	680 UJ	27 U	27 U	27 U	5 U
1,1,2-TRICHLOROETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
1,1-DICHLOROETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
1,1-DICHLOROETHENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
1,2-DICHLOROETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
1,2-DICHLOROPROPANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
2-BUTANONE	1400 UJ	728 UJ	56 U	140	1500 UJ	1400 UJ	59 U	1400 UJ	54 U	53.5 U	53 U	11 U
2-HEXANONE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
4-METHYL-2-PENTANONE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
ACETONE	1400 UJ	730 UJ	60 UJ	340 J	1500 UJ	1400 UJ	59 UJ	1400 UJ	1400 J	716.75 J	67 UJ	16 UJ
BENZENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
BROMODICHLOROMETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
BROMOFORM	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
BROMOMETHANE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
CARBON DISULFIDE	710 U	11 J	11 J	7 J	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
CARBON TETRACHLORIDE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
CHLOROBENZENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
CHLORODIBROMOMETHANE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
CHLOROETHANE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
CHLOROFORM	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
CHLOROMETHANE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
CIS-1,3-DICHLOROPROPENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
ETHYLBENZENE	290 J	152 J	28 U	73	800	240 J	29 U	320 J	27 U	27 U	27 U	5 U
METHYLENE CHLORIDE	710 UJ	392 UJ	74 UJ	86 J	740 UJ	800 UJ	76 UJ	680 UJ	52 J	52 J	74 UJ	49 J
STYRENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
TETRACHLOROETHENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
TOLUENE	180 J	97 J	28 U	170	390 J	690 U	29 U	210 J	27 U	27 U	27 U	5 U
TOTAL 1,2-DICHLOROETHENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
TOTAL XYLENES	1800	927	54	530	7000	2500	7 J	2700	16 J	16 J	27 U	3 J
TRANS-1,3-DICHLOROPROPENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
TRICHLOROETHENE	710 U	369 U	28 U	29 U	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
VINYL ACETATE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
VINYL CHLORIDE	1400 U	728 U	56 U	57 U	1500 U	1400 U	59 U	1400 U	54 U	53.5 U	53 U	11 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
1,2-DICHLOROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
1,3-DICHLOROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
1,4-DICHLOROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
2,4,6-TRICHLOROPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2,4-DICHLOROPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2,4-DIMETHYLPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2,4-DINITROPHENOL	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
2,4-DINITROTOLUENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2,6-DINITROTOLUENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2-CHLORONAPHTHALENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2-CHLOROPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2-METHYLNAPHTHALENE	1200 J	1200 J	4600 U	19000 U	24000	11000 U	1200 U	19000	2500 U	2000 U	1500 U	370 U
2-METHYLPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
2-NITROANILINE	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
2-NITROPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
3,3'-DICHLOROBENZIDINE	9100 U	9100 UJ	9100 UJ	38000 U	41000 U	22000 U	2400 U	26000 U	5000 U	3950 UJ	2900 UJ	730 U
3-NITROANILINE	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
4,6-DINITRO-2-METHYLPHENOL	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
4-BROMOPHENYL PHENYL ETHER	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
4-CHLORO-3-METHYLPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
4-CHLOROANILINE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
4-METHYLPHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
4-NITROANILINE	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
4-NITROPHENOL	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
ACENAPHTHENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
ACENAPHTHYLENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
ANTHRACENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(A)ANTHRACENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(A)PYRENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(B)FLUORANTHENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(G,H,I)PERYLENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(K)FLUORANTHENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZOIC ACID	22000 UJ	22000 UJ	22000 UJ	91000 U	99000 U	54000 U	5900 U	62000 U	12000 UJ	9550 UJ	7100 UJ	1800 UJ
BENZYL ALCOHOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BIS(2-CHLOROETHOXY)METHANE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BIS(2-CHLOROETHYL)ETHER	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	170 J	13000 U	1800 J	2650 J	3500	220 J
BUTYL BENZYL PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
CHRYSENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
DI-N-BUTYL PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 UJ
DI-N-OCTYL PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
DIBENZO(A,H)ANTHRACENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
DIETHYL PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
DIMETHYL PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
FLUORANTHENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
FLUORENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
HEXACHLOROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
HEXACHLOROBUTADIENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
HEXACHLOROCYCLOPENTADIENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
HEXACHLOROETHANE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
INDENO(1,2,3-CD)PYRENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
ISOPHORONE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
N-NITROSODIPHENYLAMINE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
NAPHTHALENE	4600 U	4600 U	4600 U	5700 J	8000 J	11000 U	1200 U	4200 J	2500 U	2000 U	1500 U	370 U
NITROBENZENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
PENTACHLOROPHENOL	22000 U	22000 U	22000 U	91000 U	99000 U	54000 U	5900 U	62000 U	12000 U	9550 U	7100 U	1800 U
PHENANTHRENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
PHENOL	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
PYRENE	4600 U	730 J	730 J	2100 J	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
Pesticides PCBs (ug/kg)												
4,4'-DDD	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
4,4'-DDE	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
4,4'-DDT	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
ALDRIN	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
ALPHA-BHC	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
ALPHA-CHLORDANE	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1016	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1221	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1232	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1242	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1248	460 U	415 U	370 U						430 U	305 U	180 U	89 U
AROCLOR-1254	920 U	830 U	740 U						870 U	615 U	360 U	180 U
AROCLOR-1260	920 U	830 U	740 U						870 U	615 U	360 U	180 U
BETA-BHC	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
DELTA-BHC	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
DIELDRIN	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
ENDOSULFAN I	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
ENDOSULFAN II	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
ENDOSULFAN SULFATE	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
ENDRIN	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	92 U	83 U	74 U						87 U	61.5 U	36 U	18 U
GAMMA-BHC (LINDANE)	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
GAMMA-CHLORDANE	460 U	415 U	370 U						430 U	305 U	180 U	89 U
HEPTACHLOR	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
HEPTACHLOR EPOXIDE	46 U	41.5 U	37 U						43 U	30.5 U	18 U	8.9 U
METHOXYCHLOR	460 U	415 U	370 U						430 U	305 U	180 U	89 U
TOXAPHENE	920 U	830 U	740 U						870 U	615 U	360 U	180 U
Inorganics (mg/kg)												
ALUMINUM	7100	10300	13500	4590	4350	3560	3540	3790	4190	3895	3600	4100
ANTIMONY	4.1 J	3.55 J	3 J	2.8 U	2.7 U	2.8 U	3.3 U	2.7 U	2.7 U	2.7 U	2.7 U	3.2 J
ARSENIC	3.1	2.65 J	2.2 J	0.89 UJ	1.4 UJ	0.68 UJ	0.79 UJ	0.49 UJ	0.88 UJ	0.67 J	0.67 J	1.6 UJ
BARIUM	265	277.5	290	59.7	46.1	22.6 J	15.1 J	24.6 J	8.2 J	7.7 J	7.2 J	7.7 J
BERYLLIUM	0.06 U	0.085 J	0.14 J	0.07 J	0.05 U	0.05 U	0.06 U	0.06 J	0.08 J	0.0525 J	0.05 U	0.05 U
CADMIUM	3.3 J	9.45 J	15.6	0.61 U	0.61 U	0.61 U	0.72 U	1.9	0.84 J	1.12 J	1.4	0.6 U
CALCIUM	512 UJ	424 J	592 J	181 UJ	205 UJ	126 UJ	131 UJ	172 UJ	109 UJ	100.75 J	147 J	118 UJ
CHROMIUM	23.2	33.5	43.8	7.1	8	3.7	3.6	9	4.5	4.15	3.8	32
COBALT	4.8 UJ	4.15 J	5.9 J	1.1 UJ	1.4 UJ	0.8 UJ	0.41 U	0.99 UJ	0.95 UJ	0.55 J	0.55 J	1.3 UJ
COPPER	192 J	253 J	314	25.2 J	32.7 J	9.2 J	10.9 J	106 J	4.3 UJ	3.875 J	5.6	4.5 UJ
IRON	41600 J	46650 J	51700	2590 J	5610 J	2110 J	1760 J	2090 J	2110 J	2045 J	1980	3270 J
LEAD	160	164	168	61.1	44.9	23.4	15.9 UJ	99.5	42.8	42.95	43.1	16.1 UJ
MAGNESIUM	518 J	587.5 J	657 J	171 J	192 J	114 J	97.2 J	127 J	119 J	94.2 J	69.4 J	122 J
MANGANESE	309 J	383 J	457	34.1 J	57.2 J	28.8 J	23.8 J	21.3 J	15.7 J	14.75 J	13.8	125 J
MERCURY	0.05 U	0.03 U	0.01 U	0.05 U	0.05 U	0.05 U	0.06 U	0.05 U	0.05 U	0.035 U	0.02 U	0.05 U
NICKEL	11.4 UJ	12.7 J	19.7	2.4 U	3 UJ	2.4 U	3.6 UJ	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
POTASSIUM	2860	2895	2930	462 J	436 J	198 J	170 J	235 J	129 U	129 U	129 U	131 U
SELENIUM	0.49 UJ	0.485 UJ	0.48 U	0.47 U	0.46 U	0.47 U	0.55 UJ	0.45 U	0.45 U	0.45 U	0.45 U	0.46 U
SILVER	0.44 UJ	0.39 UJ	0.34 U	0.37 UJ	0.33 UJ	0.33 U	0.39 U	0.32 U	0.32 U	0.32 U	0.32 U	0.33 U
SODIUM	270 UJ	218.5 J	302 J	175 UJ	192 UJ	159 UJ	158 UJ	174 UJ	137 UJ	126.75 J	185 J	127 UJ
THALLIUM	0.37 UJ	0.37 UJ	0.37 U	0.36 U	0.35 U	0.36 U	0.42 U	0.34 U	0.34 UJ	0.34 UJ	0.34 U	0.35 UJ
VANADIUM	5.7 J	5.8 J	5.9 J	5.9 J	5 J	4.5 J	4.8 J	4.2 J	6 J	5.6 J	5.2 J	6.3 J
ZINC	326	552.5	779	48.6 UJ	77 UJ	29.7 UJ	15.2 UJ	45.8 UJ	15.6 UJ	13.4 J	19 J	19.1 UJ
Miscellaneous Parameters (mg/kg)												
CYANIDE	0.26 U	0.26 U	0.26 U	0.25 U	0.24 U	0.24 U	0.66 U	0.24 U	0.23 U	0.235 U	0.24 U	0.24 U
Petroleum Hydrocarbons (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	9190	10245	11300	15600	17400	14100	806	16300	16000	17650	19300	1.8 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)									
1,1,1-TRICHLOROETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1,2,2-TETRACHLOROETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1,2-TRICHLOROETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1-DICHLOROETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 UJ	6 UJ
1,1-DICHLOROETHENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
1,2-DICHLOROETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
1,2-DICHLOROPROPANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
2-BUTANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 UJ
2-HEXANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 UJ
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
ACETONE	11 UJ	11 UJ	11 UJ	11 UJ	21 UJ	16 UJ	11 U	11 U	11 U
BENZENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
BROMODICHLOROMETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
BROMOFORM	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	5 U	6 U	6 U	1 J	5 U	4 J	2 J	6 U	6 U
CARBON TETRACHLORIDE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLOROBENZENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLORODIBROMOMETHANE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 U	11 U
CIS-1,3-DICHLOROPROPENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
ETHYLBENZENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
METHYLENE CHLORIDE	18 UJ	26 UJ	16 UJ	41 UJ	28 UJ	34 UJ	30 UJ	27 UJ	17 UJ
STYRENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TETRACHLOROETHENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TOLUENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TOTAL 1,2-DICHLOROETHENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TOTAL XYLENES	5 U	2 J	2 J	3 J	3 J	3 J	5 U	2 J	6 U
TRANS-1,3-DICHLOROPROPENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TRICHLOROETHENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
VINYL ACETATE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 UJ
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)									
1,2,4-TRICHLOROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
1,2-DICHLOROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
1,3-DICHLOROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
1,4-DICHLOROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
2,4,6-TRICHLOROPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2,4-DICHLOROPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2,4-DIMETHYLPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2,4-DINITROPHENOL	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 UJ	1700 UJ
2,4-DINITROTOLUENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2,6-DINITROTOLUENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2-CHLORONAPHTHALENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2-CHLOROPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2-METHYLNAPHTHALENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2-METHYLPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
2-NITROANILINE	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
2-NITROPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
3,3'-DICHLOROBENZIDINE	720 U	750 U	690 UJ	700 UJ	710 UJ	710 UJ	730 UJ	770 U	710 U
3-NITROANILINE	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
4,6-DINITRO-2-METHYLPHENOL	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
4-BROMOPHENYL PHENYL ETHER	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
4-CHLORO-3-METHYLPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
4-CHLOROANILINE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
4-METHYLPHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
4-NITROANILINE	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
4-NITROPHENOL	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
ACENAPHTHENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
ACENAPHTHYLENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
ANTHRACENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(A)ANTHRACENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(A)PYRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(B)FLUORANTHENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(G,H,I)PERYLENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(K)FLUORANTHENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZOIC ACID	1700 U	1800 U	1700 UJ	1700 UJ	1700 UJ	1700 UJ	1800 UJ	1900 UJ	1700 UJ
BENZYL ALCOHOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BIS(2-CHLOROETHOXY)METHANE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BIS(2-CHLOROETHYL)ETHER	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	370 U	350 U	350 U	350 U	75 J	370 U	380 U	350 U
BUTYL BENZYL PHTHALATE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
CHRYSENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
DI-N-BUTYL PHTHALATE	360 UJ	370 UJ	350 UJ	350 UJ	350 UJ	350 UJ	370 UJ	380 UJ	350 UJ
DI-N-OCTYL PHTHALATE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
DIBENZO(A,H)ANTHRACENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
DIETHYL PHTHALATE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
DIMETHYL PHTHALATE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
FLUORANTHENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
FLUORENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
HEXACHLOROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
HEXACHLOROBUTADIENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
HEXACHLOROCYCLOPENTADIENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
HEXACHLOROETHANE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
INDENO(1,2,3-CD)PYRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
ISOPHORONE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
N-NITROSODIPHENYLAMINE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
NAPHTHALENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
NITROBENZENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
PENTACHLOROPHENOL	1700 U	1800 U	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U	1700 U
PHENANTHRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
PHENOL	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
PYRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
Pesticides PCBs (ug/kg)									
4,4'-DDD	17 U	18 U							
4,4'-DDE	17 U	18 U							
4,4'-DDT	17 U	18 U							
ALDRIN	8.7 U	9.1 U							
ALPHA-BHC	8.7 U	9.1 U							
ALPHA-CHLORDANE	87 U	91 U							
AROCLOR-1016	87 U	91 U							
AROCLOR-1221	87 U	91 U							
AROCLOR-1232	87 U	91 U							
AROCLOR-1242	87 U	91 U							
AROCLOR-1248	87 U	91 U							
AROCLOR-1254	170 U	180 U							
AROCLOR-1260	170 U	180 U							
BETA-BHC	8.7 U	9.1 U							
DELTA-BHC	8.7 U	9.1 U							
DIELDRIN	17 U	18 U							
ENDOSULFAN I	8.7 U	9.1 U							
ENDOSULFAN II	17 U	18 U							
ENDOSULFAN SULFATE	17 U	18 U							
ENDRIN	17 U	18 U							

APPENDIX TABLE A-10-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	17 U	18 U							
GAMMA-BHC (LINDANE)	8.7 U	9.1 U							
GAMMA-CHLORDANE	87 U	91 U							
HEPTACHLOR	8.7 U	9.1 U							
HEPTACHLOR EPOXIDE	8.7 U	9.1 U							
METHOXYCHLOR	87 U	91 U							
TOXAPHENE	170 U	180 U							
Inorganics (mg/kg)									
ALUMINUM	4840	6050	4740	8390	3880	3680	3600	3330	4200
ANTIMONY	2.7 U	2.8 U	2.7 U	2.6 U	2.7 U	2.7 U	2.7 U	2.8 U	2.7 U
ARSENIC	1 UJ	1.3 UJ	0.75 J	1.7 J	0.49 J	0.36 J	0.32 J	0.55 J	0.31 J
BARIUM	5.6 J	5.9 J	6.4 J	7 J	5.7 J	10.3 J	25.4 J	2.5 J	5.3 J
BERYLLIUM	0.06 J	0.07 J	0.05 U	0.06 J	0.05 U	0.08 J	0.07 J	0.07 J	0.08 J
CADMIUM	0.59 U	0.62 U	0.61 U	38.8	0.95 J	0.59 U	1.2	0.61 U	0.69 J
CALCIUM	102 UJ	121 UJ	245 J	116 J	79.3 J	98.3 J	232 J	157 J	124 J
CHROMIUM	4.4	5.4	5.9	8	5.2	3.1	6.1	4.1	2.9 J
COBALT	0.63 UJ	0.92 UJ	0.53 J	0.88 J	0.62 J	1 J	0.74 J	0.54 J	0.62 J
COPPER	2.3 UJ	3.4 UJ	5.6	6.9	6.2	4.6 J	13.5	1.8 J	5.7
IRON	2690 J	3880 J	2840	4500	2270	2350	2050	2700	2370
LEAD	7.1 UJ	4.6 UJ	6.7	10.6	9.3	4.9	22.6	4.3	6.6
MAGNESIUM	75.9 J	83.2 J	140 J	81.5 J	77.5 J	84.6 J	110 J	39.4 J	83.2 J
MANGANESE	58.8 J	67.8 J	132	77.5	58.6	29.7	92.5	12.1	67.3
MERCURY	0.05 U	0.05 U	0.02 U	0.01 U	0.01 U	0.02 U	0.01 U	0.02 U	0.01 U
NICKEL	2.3 U	2.4 U	2.4 U	2.9 J	3.3 J	2.7 J	2.3 U	2.4 U	3.1 J
POTASSIUM	130 U	136 U	145 J	165 J	130 U	130 U	138 J	135 U	130 U
SELENIUM	0.45 U	0.47 U	0.46 U	0.45 U	0.45 U	0.45 U	0.46 U	0.47 U	0.45 U
SILVER	0.32 U	0.34 U	0.33 U	0.32 U	0.32 U	0.32 U	0.33 U	0.33 U	0.32 U
SODIUM	140 UJ	156 UJ	171 J	147 J	170 J	227 J	260 J	181 J	175 J
THALLIUM	0.34 UJ	0.36 U	0.35 U	0.34 U	0.53 J	0.34 U	0.35 U	0.36 U	0.34 U
VANADIUM	7 J	9.5 J	7.4 J	12.1	5.6 J	5.2 J	5.3 J	7.1 J	5.5 J
ZINC	7.6 UJ	7.3 UJ	14.9 J	25.8 J	20.1 J	5.7 J	21.9 J	7.8	9.3 J
Miscellaneous Parameters (mg/kg)									
CYANIDE	0.24 U	0.56 U	0.25 U	0.23 U	0.24 U	0.24 U	0.24 U	0.25 U	0.24 U
Petroleum Hydrocarbons (mg/kg)									
TOTAL PETROLEUM HYDROCARBONS	1.8 U	4.9	8.3	1.8 U	67.7	842	19.8	15.8	1.8 U

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-01	18-SB-01	18-SB-02	18-SB-02	18-SB-04	18-SB-04	WHF-18-SB-6	18-SB-62	18-SB-62	WHF-18-SB-6
NSAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12-D
SAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12A
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,1,2-TRICHLOROETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,1-DICHLOROETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,1-DICHLOROETHENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,2-DICHLOROETHANE	11 UJ	12 UJ	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
1,2-DICHLOROPROPANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
2-BUTANONE	11 UJ	12 UJ	10 U	1300 U	1300 UJ	11 U	21 J	6500 UJ	6550 UJ	6600 UJ
2-HEXANONE	11 UJ	12 UJ	10 U	1300 U	1300 UJ	11 U	55 U	6500 UJ	6550 UJ	6600 UJ
4-METHYL-2-PENTANONE	11 UJ	12 UJ	10 U	1300 U	1300 U	3 J	55 U	6500 U	6550 U	6600 U
ACETONE	58	26	24	1300 UJ	1300 UJ	11 U	55 U	6500 UJ	6550 UJ	6600 UJ
BENZENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
BROMODICHLOROMETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
BROMOFORM	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
BROMOMETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CARBON DISULFIDE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CARBON TETRACHLORIDE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CHLOROBENZENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CHLORODIBROMOMETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CHLOROETHANE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CHLOROFORM	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
CHLOROMETHANE	11 U	12 U	10 U	1300 UJ	1300 UJ	11 U	55 U	6500 UJ	6550 UJ	6600 UJ
CIS-1,3-DICHLOROPROPENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
ETHYLBENZENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
METHYLENE CHLORIDE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
STYRENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
TETRACHLOROETHENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
TOLUENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
TOTAL 1,2-DICHLOROETHENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
TOTAL XYLENES	11 U	12 U	10 U	1300 U	1300 U	16	55 U	8700	7150 J	5600 J
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
TRICHLOROETHENE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
VINYL CHLORIDE	11 U	12 U	10 U	1300 U	1300 U	11 U	55 U	6500 U	6550 U	6600 U
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
1,2-DICHLOROBENZENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
1,3-DICHLOROBENZENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
1,4-DICHLOROBENZENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2,4,5-TRICHLOROPHENOL	850 U	860 U	860 U	850 U	1700 U	1700 U	870 U	17000 UJ	12800 UJ	8600 UJ

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-01	18-SB-01	18-SB-02	18-SB-02	18-SB-04	18-SB-04	WHF-18-SB-6	18-SB-62	18-SB-62	WHF-18-SB-6
NSAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12-D
SAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12A
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2,4-DICHLOROPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2,4-DIMETHYLPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2,4-DINITROPHENOL	850 U	860 U	860 U	850 U	1700 U	1700 U	870 UJ	17000 UJ	12800 UJ	8600 UJ
2,4-DINITROTOLUENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2,6-DINITROTOLUENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2-CHLORONAPHTHALENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2-CHLOROPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2-METHYLNAPHTHALENE	350 U	350 U	350 U	350 U	970	1700	830	37000 J	33000 J	29000 J
2-METHYLPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
2-NITROANILINE	850 U	860 U	860 U	850 U	1700 U	1700 U	870 U	17000 UJ	12800 UJ	8600 UJ
2-NITROPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
3,3'-DICHLOROBENZIDINE	350 UJ	350 UJ	350 U	350 UJ	700 U	700 U	360 UJ	7200 UJ	5350 UJ	3500 UJ
3-NITROANILINE	850 U	860 U	860 U	850 U	1700 U	1700 U	870 U	17000 UJ	12800 UJ	8600 UJ
4,6-DINITRO-2-METHYLPHENOL	850 U	860 U	860 U	850 U	1700 U	1700 U	870 U	17000 UJ	12800 UJ	8600 UJ
4-BROMOPHENYL PHENYL ETHER	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
4-CHLORO-3-METHYLPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
4-CHLOROANILINE	350 U	350 U	350 U	350 U	700 U	700 U	360 UJ	7200 UJ	5350 UJ	3500 UJ
4-METHYLPHENOL	350 U	350 U	350 U	350 U	700 U	700 U	110 J	7200 UJ	5350 UJ	3500 UJ
4-NITROANILINE	850 U	860 U	860 U	850 U	1700 U	1700 U	870 UJ	17000 UJ	12800 UJ	8600 UJ
4-NITROPHENOL	850 U	860 U	860 U	850 U	1700 U	1700 U	870 UJ	17000 UJ	12800 UJ	8600 UJ
ACENAPHTHENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
ACENAPHTHYLENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
ANTHRACENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BENZO(A)ANTHRACENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BENZO(A)PYRENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BENZO(B)FLUORANTHENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BENZO(G,H,I)PERYLENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 U	5350 U	3500 U
BENZO(K)FLUORANTHENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BIS(2-CHLOROETHOXY)METHANE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BIS(2-CHLOROETHYL)ETHER	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	350 U	350 U	350 U	350 U	700 UJ	700 UJ	360 UJ	7200 UJ	5350 UJ	3500 UJ
BUTYL BENZYL PHTHALATE	350 U	350 U	350 U	350 U	700 UJ	700 UJ	360 UJ	7200 UJ	5350 UJ	3500 UJ
CHRYSENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
DI-N-BUTYL PHTHALATE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
DI-N-OCTYL PHTHALATE	350 U	350 U	350 U	350 U	700 UJ	700 UJ	360 UJ	7200 UJ	5350 UJ	3500 UJ
DIBENZO(A,H)ANTHRACENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
DIBENZOFURAN	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	850 J	850 J
DIETHYL PHTHALATE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
DIMETHYL PHTHALATE	350 U	40 J	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-01	18-SB-01	18-SB-02	18-SB-02	18-SB-04	18-SB-04	WHF-18-SB-6	18-SB-62	18-SB-62	WHF-18-SB-6
NSAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12-D
SAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12A
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
FLUORENE	350 U	350 U	350 U	350 U	700 U	79 J	360 U	7200 UJ	570 J	570 J
HEXACHLOROBENZENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
HEXACHLOROBUTADIENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
HEXACHLOROCYCLOPENTADIENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
HEXACHLOROETHANE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
INDENO(1,2,3-CD)PYRENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
ISOPHORONE	350 U	350 U	350 U	350 U	700 UJ	700 UJ	360 U	7200 UJ	5350 UJ	3500 UJ
N-NITROSO-DI-N-PROPYLAMINE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
N-NITROSODIPHENYLAMINE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
NAPHTHALENE	350 U	350 U	350 U	350 U	700 U	720	230 J	16000 J	15000 J	14000 J
NITROBENZENE	350 U	350 U	350 U	350 U	700 UJ	700 UJ	360 U	7200 UJ	5350 UJ	3500 UJ
PENTACHLOROPHENOL	850 U	860 U	860 U	850 U	1700 U	1700 U	870 U	17000 UJ	12800 UJ	8600 UJ
PHENANTHRENE	350 U	350 U	350 U	350 U	700 U	700 U	42 J	7200 UJ	5350 UJ	3500 UJ
PHENOL	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
PYRENE	350 U	350 U	350 U	350 U	700 U	700 U	360 U	7200 UJ	5350 UJ	3500 UJ
Pesticides PCBs (ug/kg)										
4,4'-DDD	4.1 J	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
4,4'-DDE	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
4,4'-DDT	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
ALDRIN	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
ALPHA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
ALPHA-CHLORDANE	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
AROCLOR-1016	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
AROCLOR-1221	71 UJ	72 UJ	72 UJ	71 UJ	71 UJ	71 UJ	73 UJ	73 UJ	72.5 UJ	72 UJ
AROCLOR-1232	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
AROCLOR-1242	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
AROCLOR-1248	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
AROCLOR-1254	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
AROCLOR-1260	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	35 UJ	36 UJ	36 UJ	35.5 UJ	35 UJ
BETA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
DELTA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
DIELDRIN	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
ENDOSULFAN I	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
ENDOSULFAN II	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
ENDOSULFAN SULFATE	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
ENDRIN	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
ENDRIN KETONE	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ	3.55 UJ	3.5 UJ
GAMMA-BHC (LINDANE)	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
GAMMA-CHLORDANE	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-01	18-SB-01	18-SB-02	18-SB-02	18-SB-04	18-SB-04	WHF-18-SB-6	18-SB-62	18-SB-62	WHF-18-SB-6
NSAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12-D
SAMPLE	18SB1-5-7	18SB1-10-12	18SB2-5-7	18SB2-10-12	18SB4-5-7	18SB4-10-12	18SB6-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12A
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
HEPTACHLOR EPOXIDE	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ
METHOXYCHLOR	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ	18 UJ
TOXAPHENE	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ
Inorganics (mg/kg)										
ALUMINUM	1940	3290	947	6280	2330	1830	4530	2630	1745	860
ANTIMONY	5.2 U	6 U	5.2 U	5.3 U	5.2 U	5.2 U	5.4 U	5.1 U	5.15 U	5.2 U
ARSENIC	1.1 J	1.6 J	0.6 J	1.6 J	0.66 J	0.78 J	1.2 J	0.65 J	0.615 J	0.58 J
BARIUM	4.7 J	4 J	2 J	3.2 J	7.1 J	2.5 J	5.2 J	2.1 J	1.41 J	0.72 J
BERYLLIUM	0.06 U	0.09 J	0.06 U	0.06 U	0.06 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
CADMIUM	0.84 U	0.96 U	0.83 U	0.85 U	0.83 U	0.84 U	0.87 U	0.82 U	0.83 U	0.84 U
CALCIUM	52.4 J	43.3 J	6.9 U	7.1 U	58.2 J	7 U	180 J	9.4 J	6.45 J	7 U
CHROMIUM	1.6 J	2.9	1.7 J	5.2	3.5	2 J	6.2	3.2	2.3 J	1.4 J
COBALT	0.6 J	0.71 J	0.47 U	0.89 J	0.47 UJ	0.48 UJ	0.71 J	0.47 U	0.475 U	0.48 U
COPPER	0.47 J	2.8 J	0.36 J	1.6 J	7	0.36 U	4.1 J	1.7 J	1.45 J	1.2 J
IRON	1640	3130	810	4140	2410	1490	4570	1590	1059	528
LEAD	1.4	1.7	0.45 J	0.85	3.8	1.5	4.9	1.8	1.7	1.6
MAGNESIUM	44.6 J	30.1 J	23.4 J	52.5 J	151 J	39 J	99.2 J	39.5 J	26.2 J	12.9 J
MANGANESE	14.8	18.4	8.3	11.1	16.7	6.4	63	6.4	4.6 J	2.8 J
MERCURY	0.04 J	0.05	0.02 U	0.02 U	0.02 J	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U
NICKEL	2.9 J	3 U	2.6 U	2.7 U	2.6 U	2.6 U	2.7 U	2.6 U	2.65 U	2.7 U
POTASSIUM	109 U	125 U	108 U	119 J	109 J	109 U	873 J	471 J	341 J	211
SELENIUM	0.45 U	0.52 U	0.45 U	0.46 U	0.45 U	0.45 U	0.47 U	0.44 U	0.445 U	0.45 U
SILVER	0.51 U	0.59 U	0.51 U	0.52 U	0.51 U	0.51 U	0.53 U	0.5 U	0.505 U	0.51 U
SODIUM	11.8 U	13.5 U	11.6 U	12 U	11.7 U	11.8 U	29.8 J	13.3 J	9.6 J	11.8 U
THALLIUM	0.54 U	0.62 U	0.53 U	0.55 U	0.53 U	0.54 U	0.56 U	0.53 U	0.535 U	0.54 U
VANADIUM	2.9 J	6.2 J	1.4 J	11	4.3 J	3.6 J	14.1	6.9 J	4.45 J	2 J
ZINC	2.1 J	2.1 J	1.1 J	2.4 J	4.5	2 J	1.4 J	1.6 J	1.165 J	0.73 J
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.52 J	0.6 J	0.75 J	0.5 J	0.7 J	0.49 J	0.44 J	0.43 J	0.425 J	0.42 J
Petroleum Hydrocarbons (mg/kg)										
TOTAL PETROLEUM HYDROCARBONS	2.3	1.8 U	3.6	2660	544	1250	901	5420	6305	7190

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-07	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	18-SB-09	18-SB-10
NSAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7-D	18SB8-10-12	18SB9-5-7	18SB10-5-7
SAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7A	18SB8-10-12	18SB9-5-7	18SB10-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/4/1993	1/4/1993	1/4/1993	1/4/1993	1/5/1993	1/4/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 UJ	57 UJ
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
2-BUTANONE	11 U	12	9 J	6 J	7100 UJ	11 UJ	57 UJ
2-HEXANONE	11 U	11 U	11 U	11 U	7100 UJ	11 UJ	57 UJ
4-METHYL-2-PENTANONE	11 U	17	11.5 J	6 J	7100 U	11 UJ	57 UJ
ACETONE	11 U	11 U	11 U	11 U	7100 UJ	11 U	130
BENZENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
BROMOFORM	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
BROMOMETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CHLOROBENZENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CHLORODIBROMOMETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CHLOROETHANE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CHLOROFORM	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	7100 UJ	11 U	57 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
ETHYLBENZENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
METHYLENE CHLORIDE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
STYRENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
TOLUENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
TOTAL 1,2-DICHLOROETHENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
TOTAL XYLENES	11 U	11 U	11 U	11 U	800 J	11 U	57 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
VINYL CHLORIDE	11 U	11 U	11 U	11 U	7100 U	11 U	57 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
1,2-DICHLOROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
1,3-DICHLOROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
1,4-DICHLOROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2,4,5-TRICHLOROPHENOL	860 U	890 U	890 U	890 U	920 U	880 U	930 U

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-07	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	18-SB-09	18-SB-10
NSAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7-D	18SB8-10-12	18SB9-5-7	18SB10-5-7
SAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7A	18SB8-10-12	18SB9-5-7	18SB10-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/4/1993	1/4/1993	1/4/1993	1/4/1993	1/5/1993	1/4/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2,4-DICHLOROPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2,4-DIMETHYLPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2,4-DINITROPHENOL	860 UJ	890 UJ	890 UJ	890 UJ	920 U	880 U	930 U
2,4-DINITROTOLUENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2,6-DINITROTOLUENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2-CHLORONAPHTHALENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2-CHLOROPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2-METHYLNAPHTHALENE	350 U	86 J	86 J	370 U	910	360 U	380 U
2-METHYLPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
2-NITROANILINE	860 U	890 U	890 U	890 U	920 U	880 U	930 U
2-NITROPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
3,3'-DICHLOROBENZIDINE	350 UJ	370 U	370 U	370 U	380 U	360 UJ	380 U
3-NITROANILINE	860 U	890 U	890 U	890 U	920 U	880 U	930 U
4,6-DINITRO-2-METHYLPHENOL	860 U	890 U	890 U	890 U	920 U	880 U	930 U
4-BROMOPHENYL PHENYL ETHER	350 U	370 U	370 U	370 U	380 U	360 U	380 U
4-CHLORO-3-METHYLPHENOL	350 U	370 U	370 U	370 U	380 U	360 U	380 U
4-CHLOROANILINE	350 UJ	370 U	370 U	370 U	380 U	360 U	380 U
4-METHYLPHENOL	350 U	250 J	265 J	280 J	380 U	360 U	380 U
4-NITROANILINE	860 UJ	890 UJ	890 UJ	890 UJ	920 U	880 U	930 U
4-NITROPHENOL	860 UJ	890 U	890 UJ	890 UJ	920 UJ	880 U	930 UJ
ACENAPHTHENE	350 U	370 UJ	370 UJ	370 U	380 U	360 U	380 U
ACENAPHTHYLENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
ANTHRACENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BENZO(A)ANTHRACENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BENZO(A)PYRENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BENZO(B)FLUORANTHENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BENZO(G,H,I)PERYLENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BENZO(K)FLUORANTHENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BIS(2-CHLOROETHOXY)METHANE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BIS(2-CHLOROETHYL)ETHER	350 U	370 U	370 U	370 U	380 U	360 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	350 UJ	370 U	370 U	370 U	380 U	360 UJ	380 U
BUTYL BENZYL PHTHALATE	350 UJ	370 U	370 U	370 U	380 UJ	360 U	380 UJ
CHRYSENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
DI-N-BUTYL PHTHALATE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
DI-N-OCTYL PHTHALATE	350 UJ	370 UJ	370 UJ	370 U	380 UJ	360 U	380 UJ
DIBENZO(A,H)ANTHRACENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
DIBENZOFURAN	350 U	370 U	370 U	370 U	380 U	360 U	380 U
DIETHYL PHTHALATE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
DIMETHYL PHTHALATE	350 U	370 U	370 U	370 U	380 U	360 U	380 U

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-07	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	18-SB-09	18-SB-10
NSAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7-D	18SB8-10-12	18SB9-5-7	18SB10-5-7
SAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7A	18SB8-10-12	18SB9-5-7	18SB10-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/4/1993	1/4/1993	1/4/1993	1/4/1993	1/5/1993	1/4/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
FLUORENE	350 U	370 U	370 U	370 U	56 J	360 U	380 U
HEXACHLOROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
HEXACHLOROBUTADIENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
HEXACHLOROCYCLOPENTADIENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
HEXACHLOROETHANE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
INDENO(1,2,3-CD)PYRENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
ISOPHORONE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
N-NITROSODIPHENYLAMINE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
NAPHTHALENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
NITROBENZENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
PENTACHLOROPHENOL	860 U	890 U	890 U	890 U	920 U	880 U	930 U
PHENANTHRENE	350 U	370 U	370 U	370 U	58 J	360 U	380 U
PHENOL	350 U	89 J	94.5 J	100 J	380 U	360 U	380 U
PYRENE	350 U	370 U	370 U	370 U	380 U	360 U	380 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
4,4'-DDE	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
4,4'-DDT	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
ALDRIN	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
ALPHA-BHC	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
ALPHA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
AROCLOR-1016	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
AROCLOR-1221	72 UJ	74 UJ	74 UJ	74 UJ	77 UJ	74 UJ	78 UJ
AROCLOR-1232	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
AROCLOR-1242	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
AROCLOR-1248	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
AROCLOR-1254	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
AROCLOR-1260	35 UJ	37 UJ	37 UJ	37 UJ	38 UJ	36 UJ	38 UJ
BETA-BHC	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
DELTA-BHC	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
DIELDRIN	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
ENDOSULFAN I	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
ENDOSULFAN II	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
ENDOSULFAN SULFATE	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
ENDRIN	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
ENDRIN KETONE	3.5 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.8 UJ	3.6 UJ	3.8 UJ
GAMMA-BHC (LINDANE)	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
GAMMA-CHLORDANE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ

APPENDIX TABLE A-10-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-07	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	18-SB-09	18-SB-10
NSAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7-D	18SB8-10-12	18SB9-5-7	18SB10-5-7
SAMPLE	18SB7-5-7	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7A	18SB8-10-12	18SB9-5-7	18SB10-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
DEPTH RANGE	5 - 7	5 - 7	5 - 7	5 - 7	10 - 12	5 - 7	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/4/1993	1/4/1993	1/4/1993	1/4/1993	1/5/1993	1/4/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
HEPTACHLOR EPOXIDE	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2 UJ	1.9 UJ	2 UJ
METHOXYCHLOR	18 UJ	19 UJ	19 UJ	19 UJ	20 UJ	19 UJ	20 UJ
TOXAPHENE	180 UJ	190 UJ	190 UJ	190 UJ	200 UJ	190 UJ	200 UJ
Inorganics (mg/kg)							
ALUMINUM	4680	10000 J	6830 J	3660 J	2480	5910	2560
ANTIMONY	5.2 U	5.4 U	5.45 U	5.5 U	5.6 U	5.4 U	5.6 U
ARSENIC	0.9 J	3.5 J	3.2 J	2.9 J	1 J	3	2.2 J
BARIUM	4.7 J	7.6 J	6.75 J	5.9 J	4.7 J	7.8 J	4.7 J
BERYLLIUM	0.07 J	0.09 J	0.09 J	0.09 J	0.06 U	0.07 J	0.06 U
CADMIUM	0.84 U	0.87 U	0.875 U	0.88 U	0.9 U	0.87 U	0.9 U
CALCIUM	7.3 J	27.2 UJ	25.25 UJ	23.3 UJ	17.6 J	9.9 J	35.1 J
CHROMIUM	4.5	7.9	5.85	3.8	8.6	4.9	10.4
COBALT	0.61 J	1 J	0.765 J	0.53 J	0.51 U	0.88 J	0.51 U
COPPER	1.7 J	1.3 UJ	1.2 UJ	1.1 UJ	0.5 J	1.4 J	0.8 J
IRON	3020	8620 J	6405 J	4190 J	4000	4640	5350
LEAD	1.6	4.8 J	4.25 J	3.7 J	4.7	11.1	5.1
MAGNESIUM	73.6 J	48.6 UJ	32.2 UJ	15.8 UJ	19.2 J	87.6 J	26.1 J
MANGANESE	22.1	18	13.45	8.9	2.9 J	23.2	16.2
MERCURY	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
NICKEL	2.7 J	2.8 U	2.8 U	2.8 U	2.8 U	2.7 U	2.8 U
POTASSIUM	109 U	1150	1185	1220	1230	312 J	637 J
SELENIUM	0.53 U	1.4 J	1.2 J	1 J	0.8 U	0.54 U	0.79 U
SILVER	0.51 U	0.53 U	0.535 U	0.54 U	0.55 U	0.53 U	0.55 U
SODIUM	11.8 U	32.6 UJ	30.65 UJ	28.7 UJ	17.6 J	12.2 U	12.6 U
THALLIUM	0.54 U	0.49 UJ	0.49 UJ	0.49 UJ	0.5 U	0.56 U	0.5 U
VANADIUM	8.4 J	21.5	16.7	11.9	15.8	10.3 J	23.9
ZINC	2.9 J	2.4 UJ	1.66 UJ	0.92 UJ	0.58 J	3.1 J	0.84 J
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.41 J	0.44 UJ	0.445 UJ	0.45 UJ	0.41 J	3.3	0.43 J
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	42.4	481	303.5	126	671	31.7	1.9 U

APPENDIX TABLE A-10-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-04	18-SB-04	WHF-18-SB-6	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	20 - 22	15 - 17	25 - 27	35 - 37	40 - 42	15 - 17	20 - 22	15 - 17	15 - 17	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
1,1,2,2-TETRACHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
1,1,2-TRICHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
1,1-DICHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
1,1-DICHLOROETHENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
1,2-DICHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 UJ	10 U	11 U	1400 U	11 UJ
1,2-DICHLOROPROPANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
2-BUTANONE	6600 UJ	11 U	1300 U	11 U	10 U	13 U	10 UJ	10 U	11 U	1400 U	11 UJ
2-HEXANONE	6600 UJ	11 U	1300 U	11 U	10 U	13 U	10 UJ	10 U	11 U	1400 U	11 UJ
4-METHYL-2-PENTANONE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 UJ	10 U	11 U	1400 U	11 UJ
ACETONE	6600 UJ	77	1300 UJ	210	31 UJ	54 UJ	20	10 J	150	1400 UJ	93
BENZENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
BROMODICHLOROMETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
BROMOFORM	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
BROMOMETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CARBON DISULFIDE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CARBON TETRACHLORIDE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CHLOROBENZENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CHLORODIBROMOMETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CHLOROETHANE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CHLOROFORM	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
CHLOROMETHANE	6600 UJ	11 U	1300 UJ	11 UJ	10 U	13 U	10 U	10 U	11 U	1400 UJ	11 U
CIS-1,3-DICHLOROPROPENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
ETHYLBENZENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
METHYLENE CHLORIDE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
STYRENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TETRACHLOROETHENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TOLUENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TOTAL 1,2-DICHLOROETHENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TOTAL XYLENES	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TRANS-1,3-DICHLOROPROPENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
TRICHLOROETHENE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
VINYL CHLORIDE	6600 U	11 U	1300 U	11 U	10 U	13 U	10 U	10 U	11 U	1400 U	11 U
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
1,2-DICHLOROBENZENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
1,3-DICHLOROBENZENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
1,4-DICHLOROBENZENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2,4,5-TRICHLOROPHENOL	890 U	890 U	1700 U	880 U	850 U	1100 U	840 U	830 U	870 U	890 U	850 U

APPENDIX TABLE A-10-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-04	18-SB-04	WHF-18-SB-6	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	20 - 22	15 - 17	25 - 27	35 - 37	40 - 42	15 - 17	20 - 22	15 - 17	15 - 17	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,6-TRICHLOROPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2,4-DICHLOROPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2,4-DIMETHYLPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2,4-DINITROPHENOL	890 U	890 U	1700 U	880 UJ	850 UJ	1100 UJ	840 UJ	830 UJ	870 UJ	890 U	850 U
2,4-DINITROTOLUENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2,6-DINITROTOLUENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2-CHLORONAPHTHALENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2-CHLOROPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2-METHYLNAPHTHALENE	370 U	370 U	3100	360 U	350 U	440 U	350 U	340 U	360 U	170 J	350 U
2-METHYLPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
2-NITROANILINE	890 U	890 U	1700 U	880 U	850 U	1100 U	840 U	830 U	870 U	890 U	850 U
2-NITROPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
3,3'-DICHLOROBENZIDINE	370 UJ	370 UJ	690 U	360 UJ	350 UJ	440 UJ	350 UJ	340 UJ	360 UJ	370 U	350 UJ
3-NITROANILINE	890 U	890 U	1700 U	880 U	850 U	1100 U	840 U	830 U	870 U	890 U	850 U
4,6-DINITRO-2-METHYLPHENOL	890 U	890 U	1700 U	880 U	850 U	1100 U	840 U	830 U	870 U	890 U	850 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
4-CHLOROANILINE	370 UJ	370 U	690 U	360 UJ	350 UJ	440 UJ	350 UJ	340 UJ	360 UJ	370 U	350 U
4-METHYLPHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
4-NITROANILINE	890 U	890 U	1700 U	880 UJ	850 UJ	1100 UJ	840 UJ	830 UJ	870 UJ	890 U	850 U
4-NITROPHENOL	890 U	890 U	1700 U	880 U	850 U	1100 UJ	840 UJ	830 UJ	870 UJ	890 UJ	850 U
ACENAPHTHENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
ACENAPHTHYLENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
ANTHRACENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BENZO(A)ANTHRACENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BENZO(A)PYRENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BENZO(B)FLUORANTHENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BENZO(G,H,I)PERYLENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BENZO(K)FLUORANTHENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	370 U	690 UJ	360 UJ	350 UJ	440 UJ	350 UJ	340 UJ	360 UJ	370 U	350 UJ
BUTYL BENZYL PHTHALATE	370 U	370 U	690 UJ	360 UJ	350 UJ	440 UJ	350 UJ	340 UJ	360 UJ	370 UJ	350 U
CHRYSENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
DI-N-BUTYL PHTHALATE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
DI-N-OCTYL PHTHALATE	370 U	370 U	690 UJ	360 UJ	350 UJ	440 UJ	350 UJ	340 UJ	360 UJ	370 UJ	350 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
DIBENZOFURAN	370 U	370 U	690 U	360 U	350 U	440 U	63 J	340 U	360 U	370 U	350 U
DIETHYL PHTHALATE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
DIMETHYL PHTHALATE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U

APPENDIX TABLE A-10-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-04	18-SB-04	WHF-18-SB-6	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	20 - 22	15 - 17	25 - 27	35 - 37	40 - 42	15 - 17	20 - 22	15 - 17	15 - 17	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FLUORANTHENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
FLUORENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
HEXACHLOROBENZENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
HEXACHLOROBUTADIENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
HEXACHLOROETHANE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
ISOPHORONE	370 U	370 U	690 UJ	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
N-NITROSODIPHENYLAMINE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
NAPHTHALENE	370 U	370 U	1100	360 U	350 U	440 U	680	340 U	360 U	370 U	350 U
NITROBENZENE	370 U	370 U	690 UJ	360 UJ	350 UJ	440 UJ	350 U	340 U	360 U	370 U	350 U
PENTACHLOROPHENOL	890 U	890 U	1700 U	880 U	850 U	1100 U	840 U	830 U	870 U	890 U	850 U
PHENANTHRENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
PHENOL	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
PYRENE	370 U	370 U	690 U	360 U	350 U	440 U	350 U	340 U	360 U	370 U	350 U
Pesticides PCBs (ug/kg)											
4,4'-DDD	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
4,4'-DDE	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	5.5 J	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
4,4'-DDT	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	21 J	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
ALDRIN	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
ALPHA-BHC	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
ALPHA-CHLORDANE	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
AROCLOR-1016	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
AROCLOR-1221	74 UJ	74 UJ	71 UJ	74 UJ	71 UJ	89 UJ	71 UJ	70 UJ	73 UJ	74 UJ	71 UJ
AROCLOR-1232	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
AROCLOR-1242	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
AROCLOR-1248	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
AROCLOR-1254	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
AROCLOR-1260	37 UJ	37 UJ	35 UJ	36 UJ	35 UJ	44 UJ	35 UJ	34 UJ	36 UJ	37 UJ	35 UJ
BETA-BHC	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
DELTA-BHC	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
DIELDRIN	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
ENDOSULFAN I	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
ENDOSULFAN II	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
ENDOSULFAN SULFATE	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
ENDRIN	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
ENDRIN KETONE	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	4.4 UJ	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
GAMMA-BHC (LINDANE)	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
GAMMA-CHLORDANE	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ

APPENDIX TABLE A-10-3
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-04	18-SB-04	WHF-18-SB-6	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	20 - 22	15 - 17	25 - 27	35 - 37	40 - 42	15 - 17	20 - 22	15 - 17	15 - 17	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
HEPTACHLOR	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
HEPTACHLOR EPOXIDE	1.9 UJ	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	2.3 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.8 UJ
METHOXYCHLOR	19 UJ	19 UJ	18 UJ	19 UJ	18 UJ	23 UJ	18 UJ	18 UJ	18 UJ	19 UJ	18 UJ
TOXAPHENE	190 UJ	190 UJ	180 UJ	190 UJ	180 UJ	230 UJ	180 UJ	180 UJ	180 UJ	190 UJ	180 UJ
Inorganics (mg/kg)											
ALUMINUM	1640	2010	1170	1360	382	11100	1000	1020	2010	8460	1430
ANTIMONY	5.3 U	5.4 U	5.2 U	5.6 U	5.2 U	6.4 U	5.2 U	5.1 U	5.3 U	5.6 U	5.2 U
ARSENIC	0.63 J	1.2 J	0.56 J	0.5 J	0.21 U	2 J	0.33 UJ	0.21 UJ	0.65 J	1.7 J	0.57 J
BARIUM	1 J	2.1 J	1.6 J	4.1 J	1.2 J	33.3 J	0.66 J	0.46 J	0.55 J	5.6 J	0.8 J
BERYLLIUM	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.14 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
CADMIUM	0.84 U	0.86 U	0.83 U	0.9 U	0.83 U	1 U	0.83 U	0.82 U	0.85 U	0.9 U	0.84 U
CALCIUM	7 U	14.7 J	6.9 U	7.5 U	6.9 U	141 J	6.9 U	6.8 U	7 U	21.5 J	14.6 J
CHROMIUM	2.2	2.7	2.3	2.9	1.2 J	39.7	1.4 J	1.8 J	2.7	9.5	1.6 J
COBALT	0.86 J	0.49 U	0.47 UJ	0.51 UJ	0.47 UJ	0.59 UJ	0.47 U	0.47 U	0.48 U	0.92 J	0.48 U
COPPER	0.82 J	0.37 U	0.35 U	0.38 U	0.35 U	3 J	0.35 U	0.42 J	0.36 U	1.1 J	0.56 J
IRON	1200	1890	933	431	225	4360	633	558	1250	7610	873
LEAD	0.12 U	0.67	0.97	2	0.34 J	14.5	0.63	0.3 J	1.4	2.9	1
MAGNESIUM	16.5 J	11.1 J	19.9 J	16.5 J	7.5 U	300 J	8.9 J	7.4 U	7.7 U	52.3 J	7.5 U
MANGANESE	4.6	7.1	2.8 J	1.6 J	0.44 J	7.3	1.1 J	0.77 J	2.4 J	15.5	2 J
MERCURY	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ	0.1 J	0.02 U	0.02 U	0.02 U	0.02 U	0.05
NICKEL	2.7 U	2.7 U	2.6 U	2.8 U	2.6 U	3.3 U	2.6 U	2.6 U	2.7 U	2.8 U	2.6 U
POTASSIUM	109 U	112 U	110 J	117 U	108 U	823 J	189 J	107 U	110 U	841 J	202 J
SELENIUM	0.45 U	0.47 U	0.45 U	0.58 U	0.45 U	1.1 J	0.45 U	0.44 U	0.46 U	0.79 U	0.45 U
SILVER	0.52 U	0.53 U	0.51 U	0.55 U	0.51 U	0.63 U	0.51 U	0.5 U	0.52 U	0.57 J	0.51 U
SODIUM	11.9 U	12.1 U	11.6 U	12.6 U	11.6 U	25.6 J	11.6 U	11.6 U	11.9 U	16.3 J	11.8 U
THALLIUM	0.54 U	0.55 U	0.53 U	0.58 U	0.53 U	0.66 U	0.53 U	0.53 U	0.55 U	0.5 U	0.54 U
VANADIUM	3.3 J	7.9 J	2.3 J	4.6 J	1.2 J	39.9	2.4 J	2.5 J	4.3 J	23.3	3.2 J
ZINC	0.78 J	0.65 J	2.3 J	0.67 J	1 J	2.3 J	1.1 J	1.2 J	0.63 J	13.1	0.93 J
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.55 J	0.27 J	0.56 J	0.57 J	0.53 J	0.7 J	0.44 J	0.38 J	0.42 J	0.41 J	0.51 J
Petroleum Hydrocarbons (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS	298	4.9	612	41.2	1.7 U	2.1 U	311	2.4	7.3	535	10.3

APPENDIX TABLE A-10-4
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL TCLP ANALYSES
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10	18-SL-23	18-SL-25	18-SL-31	18-SL-37	18-SL-38	18-SL-40
NSAMPLE	18-SL-01TCLP	18-SL-06TCLP	18-SL-07TCLP	18-SL-08TCLP	18-SL-09TCLP	18-SL-10TCLP	18-SL-23TCLP	18-SL-25TCLP	18-SL-31TCLP	18-SL-37TCLP	18-SL-38TCLP	18-SL-40TCLP
SAMPLE	18-SL-01TCLP	18-SL-06TCLP	18-SL-07TCLP	18-SL-08TCLP	18-SL-09TCLP	18-SL-10TCLP	18-SL-23TCLP	18-SL-25TCLP	18-SL-31TCLP	18-SL-37TCLP	18-SL-38TCLP	18-SL-40TCLP
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---	---	---	---	---	---	---
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
TCLP Volatile Organics (ug/L)												
1,1-DICHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
1,2-DICHLOROETHANE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-BUTANONE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	47 J	50 U	50 U	50 U	50 U
BENZENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CARBON TETRACHLORIDE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CHLOROBENZENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CHLOROFORM	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
TETRACHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
TRICHLOROETHENE	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
VINYL CHLORIDE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
TCLP Metals (ug/L)												
ARSENIC	25.3 UJ	25.3 U	25.3 UJ	25.3 UJ	25.3 UJ	25.3 U	25.3 U	25.3 UJ	45.2 J	25.3 UJ	25.3 UJ	25.3 UJ
BARIUM	1490	1000	1380	3770	1300	1510	1980	684	3380	893	681	888
CADMIUM	2250	136	407	6.7	5 J	5.8	186	2.7 U	67.8	9 UJ	2.7 U	4.5 UJ
CHROMIUM	6.2 J	8.8 J	6.7 J	1.9 U	1.9 U	1.9 UJ	10.3 J	1.9 U	49.7	1.9 UJ	5.7 J	2.7 J
LEAD	450	259	474	152	142	599	70	256	4630	734	44.7 J	4610
MERCURY	0.2	0.03 U	0.26	0.21	0.16 U	0.19 UJ	0.17 UJ	0.14 J	0.27 UJ	0.16 UJ	0.25 UJ	0.29 UJ
SELENIUM	31.3 UJ	31.3 U	31.3 U	31.3 U	31.3 U	31.3 UJ	31.3 UJ	31.3 U	31.3 U	31.3 U	31.3 U	31.3 U
SILVER	1.5 UJ	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 UJ	1.5 UJ	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
2-BUTANONE	11 U	11.5 U	12 U	11 U	11 U	63 U	11 U	11 U	11 U	11 U	61 U	36 J
ACETONE	19 UJ	15.5 UJ	12 UJ	34 UJ	11 UJ	63 UJ	24 UJ	52 UJ	17 UJ	11 UJ	61 UJ	150 UJ
CARBON DISULFIDE	6	4.5	6 U	4 J	7	32 U	5 U	5 U	6 UJ	5 U	30 U	27 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	5 U	32 U	5 U	5 U	6 U	5 U	30 U	23 J
METHYLENE CHLORIDE	64 J	37 J	20 UJ	52 UJ	74 J	32 UJ	9 UJ	9 UJ	57 UJ	5 UJ	36 UJ	29 UJ
TOLUENE	6 U	6 U	6 U	9	1 J	32 U	5 U	5 U	6 U	5 U	30 U	10 J
TOTAL XYLENES	6 U	6 U	6 U	6 U	5 J	32 U	5 U	5 U	3 J	5 U	30 U	160
Semivolatile Organics (ug/kg)												
2-METHYLNAPHTHALENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	8100	1100 J
BENZO(A)ANTHRACENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BENZO(A)PYRENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
BIS(2-CHLOROETHOXY)METHANE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	440 J	380 U	360 U	1900 U	3700 U
BIS(2-ETHYLHEXYL)PHTHALATE	700 J	950 J	1200 J	380 UJ	350 UJ	1000 J	360 U	1800 U	56 J	360 U	340 J	3700 U
CHRYSENE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
FLUORANTHENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
FLUORENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 UJ	1900 UJ	3700 U
NAPHTHALENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	2200	3700 U
PHENANTHRENE	3000 U	3050 U	3100 U	380 U	350 U	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
PYRENE	3000 U	3050 U	3100 U	380 UJ	350 UJ	3300 U	360 U	1800 U	380 U	360 U	1900 U	3700 U
Inorganics (mg/kg)												
ALUMINUM	3850	4215	4580	3140	3100	4550	3260	3140	6530	3380	2880	3000
ANTIMONY	2.9 UJ	3.625 J	5.8 J	4.4 U	2.6 U	3.3 U	2.7 U	2.7 U	2.8 U	2.7 U	2.8 U	2.9
ARSENIC	0.55 UJ	0.825 UJ	1.1 UJ	0.59 J	0.77 J	0.72 J	0.26 J	0.22 U	0.64 J	0.46 J	1.1 J	0.9 UJ
BARIUM	17.2 J	31.2 J	45.2 J	7.1 J	5.5 J	27.2 J	6.5 J	10.6 J	38.6 J	5.7 J	32.4 J	97.7
BERYLLIUM	0.06 U	0.06 U	0.06 U	0.09 U	0.05 U	0.06 U	0.05 U	0.05 U	0.06 U	0.06 J	0.05 U	0.06 U
CADMIUM	22.6 J	28.15 J	33.7 J	2.8	0.58 U	9	0.6 U	9.3	20.6	0.88 J	0.61 U	0.63 UJ
CALCIUM	207 UJ	187 UJ	167 UJ	197 J	151 J	296 J	91.3 J	151 J	153 J	107 J	115 J	310 UJ
CHROMIUM	16.5 J	25.4 J	34.3 J	5.4	2.9	8.3	4	10.7	39.8	3.6	3.6	95.7 J
COBALT	0.37 UJ	0.835 UJ	1.3 UJ	1.3 J	1 J	0.87 J	0.78 J	0.47 J	0.35 U	0.34 U	0.76 J	4.3 UJ
COPPER	177	520.5	864	8.4 J	1.8 J	32.6	6.8	45.3	201	8	13.9	65.3 J
IRON	1710	2145	2580	1800	1700	2180	1790	1490	1990	1690	7050	35600 J
LEAD	62.6	79.35 J	96.1 J	28.9 J	6.7 J	35.6	5.1	32.6	76.5	32.3	55.4 J	57.4
MAGNESIUM	94.7 J	98.85 J	103 J	94.9 J	116 J	126 J	84.1 J	125 J	133 J	81.8 J	116 J	237 J
MANGANESE	18.3 J	20.45 J	22.6 J	24.1	102	27.8	18.5	16	38.2	27.7	52.6	317 J
MERCURY	0.08 U	0.08 U	0.08 U	0.12 U	0.07 U	0.09 U	0.01 U	0.01 U	0.08 U	0.07 U	0.08 U	0.04 J
NICKEL	2.5 U	8.575	15.9	3.8 U	2.6 J	2.8 U	2.4 U	2.4 U	2.5 J	2.3 U	3.7 J	18.9 J
POTASSIUM	141 U	143.25 J	216 J	280 J	293 J	158 U	199 J	194 J	137 U	132 U	175 J	276 J
SILVER	0.35 U	0.525 UJ	0.7 UJ	0.53 U	0.35 J	0.39 U	0.33 U	0.33 U	0.34 U	0.33 U	0.33 U	0.34 UJ

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-01	18-SL-01	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
NSAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01-D	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SAMPLE	18-SL-01	18-SL-01-AVG	18-SL-01A	18-SL-02	18-SL-03	18-SL-04	18-SL-05	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	3 - 6	1 - 5	0 - 3	0 - 5	0 - 5	3 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/12/1992	8/14/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
SODIUM	176 UJ	203 UJ	230 UJ	279 J	164 J	220 J	182 J	155 J	163 J	171 J	196 J	210 UJ
THALLIUM	0.48 U	0.48 U	0.48 U	0.73 U	0.43 U	0.54 U	0.35 U	0.35 U	0.47 U	0.45 U	0.46 U	0.37 UJ
VANADIUM	3.5 UJ	3.55 UJ	3.6 UJ	4.4 J	4.5 J	5.4 J	4.6 J	4.2 J	3.4 J	4.4 J	3.3 J	3.8 J
ZINC	94.2 J	134.1 J	174 J	10.5 J	4.9 J	50.3 J	9.1 J	38.9	200	9.4	32.7 J	181 J
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	9020	10710	12400	195	1.7 U	13300	16.7	7410	87.4	4.6	120	6210

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
2-BUTANONE	35.5 J	35 J	11 U	12 U	30 J	11 U	55 U	36 J	17 J	12 U	12 U	12 U
ACETONE	165 UJ	180 UJ	15 UJ	32 UJ	150 UJ	34 UJ	230 UJ	160 UJ	84 UJ	20 UJ	39 UJ	71 UJ
CARBON DISULFIDE	27 U	27 U	5 U	6 UJ	27 U	5 U	27 UJ	27 U	14 U	6 U	6 UJ	6 U
ETHYLBENZENE	46.5 J	70	5 U	6 U	27 U	5 U	120	15 J	14 U	6 U	6 U	6 U
METHYLENE CHLORIDE	38 UJ	47 UJ	7 UJ	49 UJ	47 UJ	23 UJ	100 UJ	57 UJ	46 UJ	9 UJ	29 UJ	17 UJ
TOLUENE	19 J	28	5 U	6 U	14 J	5 U	34	27 U	14 U	6 U	6 U	6 U
TOTAL XYLENES	295	430	2 J	6 U	67	3 J	1000	76	14 U	6 U	3 J	4 J
Semivolatile Organics (ug/kg)												
2-METHYLNAPHTHALENE	1100 J	3700 U	360 U	360 U	350 U	360 U	11000 J	15000 J	1900 U	3800 U	1900 U	380 U
BENZO(A)ANTHRACENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BENZO(A)PYRENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BIS(2-CHLOROETHOXY)METHANE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	3700 U	3700 U	110 J	360 U	76 J	360 U	7300 UJ	8900 UJ	320 J	3800 U	1900 U	380 U
CHRYSENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
FLUORANTHENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
FLUORENE	3700 U	3700 U	360 U	360 U	440	360 U	7300 UJ	8900 UJ	1900 UJ	3800 UJ	1900 UJ	380 UJ
NAPHTHALENE	3700 U	3700 U	360 U	360 U	990	360 U	3000 J	3500 J	1900 U	3800 U	1900 U	380 U
PHENANTHRENE	3700 U	3700 U	360 U	360 U	120 J	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 U
PYRENE	3700 U	3700 U	360 U	360 U	350 U	360 U	7300 UJ	8900 UJ	1900 U	3800 U	1900 U	380 UJ
Inorganics (mg/kg)												
ALUMINUM	2760 J	2520 J	3240	2480	3990	4880	4240	3910	2260	3780	2300	4690
ANTIMONY	2.125 J	2.7 UJ	2.8 U	2.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.8 U	2.9 U
ARSENIC	1.55 UJ	2.2 UJ	0.53 J	0.52 J	0.66 J	0.78 J	0.56 J	0.53 J	0.36 J	0.73 J	0.67 J	1 J
BARIUM	95	92.3	14.1 J	4.3 J	5.7 J	6 J	10.9 J	7.2 J	25 J	31.4 J	24 J	9.2 J
BERYLLIUM	0.06 J	0.09 J	0.06 U	0.05 U	0.05 U	0.07 J	0.05 U	0.05 U	0.05 U	0.06 J	0.09 J	0.08 J
CADMIUM	0.5075 J	0.7 J	0.81 J	0.62 U	0.59 U	0.99 J	0.6 U	0.59 U	0.6 U	1.2	2.5	0.63 U
CALCIUM	316 UJ	322 UJ	160 J	112 J	93 J	80.1 J	96.9 J	151 J	96.6 J	181 J	353 J	1050 J
CHROMIUM	52.95 J	10.2 J	4.5	1.5 J	5.4	3.1	8.6	3.8	2.4 J	15.5	5	3.5
COBALT	3.25 UJ	2.2 UJ	0.45 J	0.35 U	0.34 U	0.81 J	0.4 J	0.4 J	0.34 U	1.8 J	1.3 J	1.4 J
COPPER	45.1 J	24.9 J	6.5	2.4 J	3.2 J	3.5 J	3 J	8.7	3.8 J	9.5	10.3	3 J
IRON	24850 J	14100 J	1760	1600	2240	2810	2870	2060	1750	4190	1900	3340
LEAD	72.95	88.5	60 J	3.2 J	29.6	3.4 J	54.5 J	19	20	48.7	57.9	11.5
MAGNESIUM	211 J	185 J	92.4 J	63.4 J	122 J	88.7 J	106 J	137 J	53.4 J	94.6 J	78.5 J	87.6 J
MANGANESE	220.5 J	124 J	13.8	68.8	21.3	79.3	19.3	22.9	15.1	20.8	35.2	47.8
MERCURY	0.05 J	0.06 J	0.08 U	0.08 U	0.07 U	0.08 U	0.07 U	0.08 U	0.09 U	0.07 J	0.06 J	0.06 J
NICKEL	12.15 J	5.4 J	3.4 J	2.4 U	2.9 J	3.9 J	2.3 U	7 J	3.1 J	2.6 J	2.4 U	3.3 J
POTASSIUM	268.5 J	261 J	318 J	145 J	247 J	346 J	301 J	297 J	166 J	181 J	198 J	139 U
SILVER	0.335 UJ	0.33 UJ	0.34 U	0.33 U	0.32 U	0.33 U	0.32 U	0.32 U	0.33 U	0.33 UJ	0.33 UJ	0.34 UJ

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-10	18-SL-10	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
NSAMPLE	18-SL-10-AVG	18-SL-10-D	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SAMPLE	18-SL-10-AVG	18-SL-10A	18-SL-11	18-SL-12	18-SL-13	18-SL-14	18-SL-15	18-SL-16	18-SL-17	18-SL-18	18-SL-19	18-SL-20
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	3 - 6	3 - 6	2 - 4	0 - 5	0 - 8	1 - 5	1 - 4	2 - 6	1 - 4	1 - 4	1 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
SODIUM	189.5 UJ	169 UJ	182 J	169 J	164 J	179 J	195 J	213 J	216 J	155 J	137 J	150 J
THALLIUM	0.36 UJ	0.35 UJ	0.46 U	0.46 U	0.44 U	0.45 U	0.45 U	0.44 U	0.45 U	0.36 U	0.36 U	0.37 U
VANADIUM	3.35 J	2.9	4 J	3.4 J	5 J	6.4 J	6.2 J	4.7 J	3 J	8.4 J	2.9 J	8 J
ZINC	140.15 J	99.3 J	21.2 J	4.3 J	9.4 J	8.9 J	9.1 J	27.5 J	17.6 J	16.5 J	28.6 J	21.3 J
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	5515	4820	56.6	1.8 U	55.7	1.8 U	23500	10600	7040	1350	389	1.9 U

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
2-BUTANONE	12 U	13 U	12 U	11.5 U	11 U	11 U	54 U	12 U	1700	11 U	61 U	55 U
ACETONE	200 UJ	180 UJ	12 UJ	13 UJ	14 UJ	43 UJ	250 UJ	110 UJ	1400 UJ	19 UJ	82 UJ	55 UJ
CARBON DISULFIDE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 UJ	27 UJ	6 UJ	680 U	6 U	30 UJ	27 U
ETHYLBENZENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	190	6 U	430 J	6 U	30 U	27 U
METHYLENE CHLORIDE	12 UJ	25 UJ	32 UJ	44 UJ	56 UJ	34 UJ	57 UJ	24 UJ	680 UJ	10 UJ	85 UJ	38 UJ
TOLUENE	6 U	6 U	6 UJ	6 UJ	6 UJ	6 U	47	6 U	190 J	6 U	30 U	27 U
TOTAL XYLENES	4 J	2 J	6 UJ	2 J	2 J	6 U	670	1 J	3300	1 J	30 U	12 J
Semivolatile Organics (ug/kg)												
2-METHYLNAPHTHALENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	14000	370 U	33000 J	360 U	4000 U	1500 U
BENZO(A)ANTHRACENE	390 U	390 U	1300 J	1300 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BENZO(A)PYRENE	390 U	390 U	1200 J	1200 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BIS(2-CHLOROETHOXY)METHANE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	390 U	5600 J	4850 J	4100 J	68 J	5400 U	370 U	8900 UJ	360 U	790 J	600 J
CHRYSENE	390 U	390 U	1400 J	1400 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
FLUORANTHENE	390 U	390 U	3500 J	3500 J	9500 UJ	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
FLUORENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	5400 UJ	370 U	8900 UJ	360 U	4000 UJ	1500 UJ
NAPHTHALENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	4100 J	370 U	7500 J	360 U	4000 U	1500 U
PHENANTHRENE	390 U	390 U	9500 UJ	9500 UJ	9500 UJ	370 U	730 J	370 U	2200 J	360 U	4000 U	1500 U
PYRENE	390 U	390 U	7700 J	6950 J	6200 J	370 U	5400 U	370 U	8900 UJ	360 U	4000 U	1500 U
Inorganics (mg/kg)												
ALUMINUM	1510	1990	13200 J	9085 J	4970 J	3480	3790	2310	4100	1730	2910	3330
ANTIMONY	3 U	3 U	2.9 UJ	2.475 J	3.5 J	2.8 U	2.7 U	2.9 U	2.7 U	2.7 U	3.1 U	2.8 U
ARSENIC	0.37 J	0.51 J	1 UJ	1.3 UJ	1.6 UJ	0.63 J	0.58 J	0.56 J	0.71 J	0.24 J	0.81 J	0.74 J
BARIUM	4.8 J	3.4 J	198	193	188	6.9 J	5.2 J	28.8 J	4.7 J	6.8 J	46.2 J	13.4 J
BERYLLIUM	0.11 J	0.06 U	0.09 J	0.085 J	0.08 J	0.06 U	0.08 J	0.1 J	0.08 J	0.05 U	0.06 U	0.09 J
CADMIUM	0.67 U	1 J	5.5	5.25 J	5 J	0.63 U	0.6 J	1.2 J	0.59 U	0.6 U	0.91 J	0.63 U
CALCIUM	367 J	189 J	786 UJ	670.5 UJ	555 UJ	185 J	211 J	100 J	75.2 J	63 J	148 J	167 J
CHROMIUM	3.1	3.4	33.9	28.65 J	23.4 J	8.7	3.6	5.6	3.6	1.8 J	6.6	2.6
COBALT	0.77 J	1.1 J	2.3 UJ	2.6 UJ	2.9 UJ	1.8 J	1.9 J	1.1 J	1.4 J	0.34 U	2 J	0.36 U
COPPER	7.5 J	7.3 J	236 J	152.3 J	68.6 J	14.5	5.2 J	6.9 J	6.4 J	5.6 J	27.5	7.2 J
IRON	1140	1520	12900	18200 J	23500 J	2070	2500	1530	2350	1490	3200	1790
LEAD	8.4	10.4	59.6	61.4	63.2	24.5	19.1	16.8	35.1	3.2	32.1	22.2
MAGNESIUM	67.3 J	33.8 J	455 J	361 J	267 J	90 J	93.2 J	65.4 J	106 J	35.6 J	136 J	83.4 J
MANGANESE	18	15.1	131	136 J	141 J	12.2	134	45.8	21.7	39.6	35.4	45
MERCURY	0.09 J	0.08 J	0.25	0.16 J	0.07 J	0.09 J	0.06 J	0.05 J	0.08 J	0.19	0.08 J	0.07 J
NICKEL	2.6 J	2.6 J	6.5 J	6.6 J	6.7 J	2.5 U	2.3 U	4.5 J	2.3 U	2.3 U	7.2 J	2.5 J
POTASSIUM	147 U	149 J	1210	1135 J	1060 J	138 U	301 J	260 J	259 J	132 U	359 J	168 J
SILVER	0.36 UJ	0.36 UJ	0.35 UJ	0.345 UJ	0.34 UJ	0.34 UJ	0.32 UJ	0.35 UJ	0.32 UJ	0.33 UJ	0.37 UJ	0.34 UJ

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-21	18-SL-22	18-SL-23	18-SL-23	18-SL-23	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
NSAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23-D	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SAMPLE	18-SL-21	18-SL-22	18-SL-23	18-SL-23-AVG	18-SL-23A	18-SL-24	18-SL-25	18-SL-26	18-SL-27	18-SL-28	18-SL-29	18-SL-30
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 5	0 - 5	1 - 4	1 - 4	1 - 4	0 - 4	0 - 1	0 - 4	0 - 5	0 - 4	0 - 4	0 - 4
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
SODIUM	232 J	201 J	226 UJ	219 UJ	212 UJ	173 J	190 J	231 J	169 J	137 J	203 J	156 J
THALLIUM	0.39 U	0.38 U	0.37 UJ	0.365 UJ	0.36 UJ	0.36 U	0.34 U	0.37 U	0.34 U	0.35 U	0.39 U	0.36 U
VANADIUM	2.6 J	4 J	4.3 J	4.05 J	3.8 J	5 J	5.4 J	3.7 J	5.4 J	2.4 J	3.3 J	4.4 J
ZINC	10.1 J	9.8 J	631 J	420.5 J	210 J	11.7 J	7 J	27.9 J	5.5 J	11 J	57.7 J	9.8 J
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	2.9	54.8	18800	18300	17800	113	9950	58.6	20500	1.8 U	8770	2170

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)												
2-BUTANONE	1400 UJ	728 UJ	56 U	140	1500 UJ	1400 UJ	59 U	1400 UJ	54 U	53.5 U	53 U	11 U
ACETONE	1400 UJ	730 UJ	60 UJ	340 J	1500 UJ	1400 UJ	59 UJ	1400 UJ	1400 J	716.75 J	67 UJ	16 UJ
CARBON DISULFIDE	710 U	11 J	11 J	7 J	740 U	690 U	29 U	680 U	27 U	27 U	27 U	5 U
ETHYLBENZENE	290 J	152 J	28 U	73	800	240 J	29 U	320 J	27 U	27 U	27 U	5 U
METHYLENE CHLORIDE	710 UJ	392 UJ	74 UJ	86 J	740 UJ	800 UJ	76 UJ	680 UJ	52 J	52 J	74 UJ	49 J
TOLUENE	180 J	97 J	28 U	170	390 J	690 U	29 U	210 J	27 U	27 U	27 U	5 U
TOTAL XYLENES	1800	927	54	530	7000	2500	7 J	2700	16 J	16 J	27 U	3 J
Semivolatile Organics (ug/kg)												
2-METHYLNAPHTHALENE	1200 J	1200 J	4600 U	19000 U	24000	11000 U	1200 U	19000	2500 U	2000 U	1500 U	370 U
BENZO(A)ANTHRACENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BENZO(A)PYRENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BIS(2-CHLOROETHOXY)METHANE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	170 J	13000 U	1800 J	2650 J	3500	220 J
CHRYSENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
FLUORANTHENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
FLUORENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
NAPHTHALENE	4600 U	4600 U	4600 U	5700 J	8000 J	11000 U	1200 U	4200 J	2500 U	2000 U	1500 U	370 U
PHENANTHRENE	4600 U	4600 U	4600 U	19000 U	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
PYRENE	4600 U	730 J	730 J	2100 J	20000 U	11000 U	1200 U	13000 U	2500 U	2000 U	1500 U	370 U
Inorganics (mg/kg)												
ALUMINUM	7100	10300	13500	4590	4350	3560	3540	3790	4190	3895	3600	4100
ANTIMONY	4.1 J	3.55 J	3 J	2.8 U	2.7 U	2.8 U	3.3 U	2.7 U	2.7 U	2.7 U	2.7 U	3.2 J
ARSENIC	3.1	2.65 J	2.2 J	0.89 UJ	1.4 UJ	0.68 UJ	0.79 UJ	0.49 UJ	0.88 UJ	0.67 J	0.67 J	1.6 UJ
BARIUM	265	277.5	290	59.7	46.1	22.6 J	15.1 J	24.6 J	8.2 J	7.7 J	7.2 J	7.7 J
BERYLLIUM	0.06 U	0.085 J	0.14 J	0.07 J	0.05 U	0.05 U	0.06 U	0.06 J	0.08 J	0.0525 J	0.05 U	0.05 U
CADMIUM	3.3 J	9.45 J	15.6	0.61 U	0.61 U	0.61 U	0.72 U	1.9	0.84 J	1.12 J	1.4	0.6 U
CALCIUM	512 UJ	424 J	592 J	181 UJ	205 UJ	126 UJ	131 UJ	172 UJ	109 UJ	100.75 J	147 J	118 UJ
CHROMIUM	23.2	33.5	43.8	7.1	8	3.7	3.6	9	4.5	4.15	3.8	32
COBALT	4.8 UJ	4.15 J	5.9 J	1.1 UJ	1.4 UJ	0.8 UJ	0.41 U	0.99 UJ	0.95 UJ	0.55 J	0.55 J	1.3 UJ
COPPER	192 J	253 J	314	25.2 J	32.7 J	9.2 J	10.9 J	106 J	4.3 UJ	3.875 J	5.6	4.5 UJ
IRON	41600 J	46650 J	51700	2590 J	5610 J	2110 J	1760 J	2090 J	2110 J	2045 J	1980	3270 J
LEAD	160	164	168	61.1	44.9	23.4	15.9 UJ	99.5	42.8	42.95	43.1	16.1 UJ
MAGNESIUM	518 J	587.5 J	657 J	171 J	192 J	114 J	97.2 J	127 J	119 J	94.2 J	69.4 J	122 J
MANGANESE	309 J	383 J	457	34.1 J	57.2 J	28.8 J	23.8 J	21.3 J	15.7 J	14.75 J	13.8	125 J
MERCURY	0.05 U	0.03 U	0.01 U	0.05 U	0.05 U	0.05 U	0.06 U	0.05 U	0.05 U	0.035 U	0.02 U	0.05 U
NICKEL	11.4 UJ	12.7 J	19.7	2.4 U	3 UJ	2.4 U	3.6 UJ	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
POTASSIUM	2860	2895	2930	462 J	436 J	198 J	170 J	235 J	129 U	129 U	129 U	131 U
SILVER	0.44 UJ	0.39 UJ	0.34 U	0.37 UJ	0.33 UJ	0.33 U	0.39 U	0.32 U	0.32 U	0.32 U	0.32 U	0.33 U

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-31	18-SL-31	18-SL-31	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37	18-SL-37	18-SL-38
NSAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31-D	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37-D	18-SL-38
SAMPLE	18-SL-31	18-SL-31-AVG	18-SL-31A	18-SL-32	18-SL-33	18-SL-34	18-SL-35	18-SL-36	18-SL-37	18-SL-37-AVG	18-SL-37A	18-SL-38
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	2 - 6
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
SODIUM	270 UJ	218.5 J	302 J	175 UJ	192 UJ	159 UJ	158 UJ	174 UJ	137 UJ	126.75 J	185 J	127 UJ
THALLIUM	0.37 UJ	0.37 UJ	0.37 U	0.36 U	0.35 U	0.36 U	0.42 U	0.34 U	0.34 UJ	0.34 UJ	0.34 U	0.35 UJ
VANADIUM	5.7 J	5.8 J	5.9 J	5.9 J	5 J	4.5 J	4.8 J	4.2 J	6 J	5.6 J	5.2 J	6.3 J
ZINC	326	552.5	779	48.6 UJ	77 UJ	29.7 UJ	15.2 UJ	45.8 UJ	15.6 UJ	13.4 J	19 J	19.1 UJ
Petroleum Hydrocarbon (mg/kg)												
TOTAL PETROLEUM HYDROCARBONS	9190	10245	11300	15600	17400	14100	806	16300	16000	17650	19300	1.8 U

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)									
2-BUTANONE	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 UJ	11 UJ
ACETONE	11 UJ	11 UJ	11 UJ	11 UJ	21 UJ	16 UJ	11 U	11 U	11 U
CARBON DISULFIDE	5 U	6 U	6 U	1 J	5 U	4 J	2 J	6 U	6 U
ETHYLBENZENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
METHYLENE CHLORIDE	18 UJ	26 UJ	16 UJ	41 UJ	28 UJ	34 UJ	30 UJ	27 UJ	17 UJ
TOLUENE	5 U	6 U	6 U	5 U	5 U	5 U	5 U	6 U	6 U
TOTAL XYLENES	5 U	2 J	2 J	3 J	3 J	3 J	5 U	2 J	6 U
Semivolatile Organics (ug/kg)									
2-METHYLNAPHTHALENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(A)ANTHRACENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BENZO(A)PYRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BIS(2-CHLOROETHOXY)METHANE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	370 U	350 U	350 U	350 U	75 J	370 U	380 U	350 U
CHRYSENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
FLUORANTHENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
FLUORENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
NAPHTHALENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
PHENANTHRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
PYRENE	360 U	370 U	350 U	350 U	350 U	350 U	370 U	380 U	350 U
Inorganics (mg/kg)									
ALUMINUM	4840	6050	4740	8390	3880	3680	3600	3330	4200
ANTIMONY	2.7 U	2.8 U	2.7 U	2.6 U	2.7 U	2.7 U	2.7 U	2.8 U	2.7 U
ARSENIC	1 UJ	1.3 UJ	0.75 J	1.7 J	0.49 J	0.36 J	0.32 J	0.55 J	0.31 J
BARIUM	5.6 J	5.9 J	6.4 J	7 J	5.7 J	10.3 J	25.4 J	2.5 J	5.3 J
BERYLLIUM	0.06 J	0.07 J	0.05 U	0.06 J	0.05 U	0.08 J	0.07 J	0.07 J	0.08 J
CADMIUM	0.59 U	0.62 U	0.61 U	38.8	0.95 J	0.59 U	1.2	0.61 U	0.69 J
CALCIUM	102 UJ	121 UJ	245 J	116 J	79.3 J	98.3 J	232 J	157 J	124 J
CHROMIUM	4.4	5.4	5.9	8	5.2	3.1	6.1	4.1	2.9 J
COBALT	0.63 UJ	0.92 UJ	0.53 J	0.88 J	0.62 J	1 J	0.74 J	0.54 J	0.62 J
COPPER	2.3 UJ	3.4 UJ	5.6	6.9	6.2	4.6 J	13.5	1.8 J	5.7
IRON	2690 J	3880 J	2840	4500	2270	2350	2050	2700	2370
LEAD	7.1 UJ	4.6 UJ	6.7	10.6	9.3	4.9	22.6	4.3	6.6
MAGNESIUM	75.9 J	83.2 J	140 J	81.5 J	77.5 J	84.6 J	110 J	39.4 J	83.2 J
MANGANESE	58.8 J	67.8 J	132	77.5	58.6	29.7	92.5	12.1	67.3
MERCURY	0.05 U	0.05 U	0.02 U	0.01 U	0.01 U	0.02 U	0.01 U	0.02 U	0.01 U
NICKEL	2.3 U	2.4 U	2.4 U	2.9 J	3.3 J	2.7 J	2.3 U	2.4 U	3.1 J
POTASSIUM	130 U	136 U	145 J	165 J	130 U	130 U	138 J	135 U	130 U
SILVER	0.32 U	0.34 U	0.33 U	0.32 U	0.32 U	0.32 U	0.33 U	0.33 U	0.32 U

APPENDIX TABLE A-10-5
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
NSAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SAMPLE	18-SL-39	18-SL-40	18-SL-41	18-SL-42	18-SL-43	18-SL-44	18-SL-45	18-SL-46	18-SL-47
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	ORIG	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	0 - 4	2 - 8	2 - 5	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12	0 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
SODIUM	140 UJ	156 UJ	171 J	147 J	170 J	227 J	260 J	181 J	175 J
THALLIUM	0.34 UJ	0.36 U	0.35 U	0.34 U	0.53 J	0.34 U	0.35 U	0.36 U	0.34 U
VANADIUM	7 J	9.5 J	7.4 J	12.1	5.6 J	5.2 J	5.3 J	7.1 J	5.5 J
ZINC	7.6 UJ	7.3 UJ	14.9 J	25.8 J	20.1 J	5.7 J	21.9 J	7.8	9.3 J
Petroleum Hydrocarbon (mg/kg)									
TOTAL PETROLEUM HYDROCARBONS	1.8 U	4.9	8.3	1.8 U	67.7	842	19.8	15.8	1.8 U

APPENDIX TABLE A-10-6
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-01	18-SB-01	18-SB-10	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-62	18-SB-62	WHF-18-SB-6
NSAMPLE	18SB1-10-12	18SB1-5-7	18SB10-5-7	18SB2-10-12	18SB2-5-7	18SB4-10-12	18SB4-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12-D
SAMPLE	18SB1-10-12	18SB1-5-7	18SB10-5-7	18SB2-10-12	18SB2-5-7	18SB4-10-12	18SB4-5-7	18SB6-10-12	18SB6-10-12-AVG	18SB6-10-12A
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
DEPTH RANGE	10 - 12	5 - 7	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/4/1993	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
2-BUTANONE	12 UJ	11 UJ	57 UJ	1300 U	10 U	11 U	1300 UJ	6500 UJ	6550 UJ	6600 UJ
4-METHYL-2-PENTANONE	12 UJ	11 UJ	57 UJ	1300 U	10 U	3 J	1300 U	6500 U	6550 U	6600 U
ACETONE	26	58	130	1300 UJ	24	11 U	1300 UJ	6500 UJ	6550 UJ	6600 UJ
TOTAL XYLENES	12 U	11 U	57 U	1300 U	10 U	16	1300 U	8700	7150 J	5600 J
Semivolatile Organics (ug/kg)										
2-METHYLNAPHTHALENE	350 U	350 U	380 U	350 U	350 U	1700	970	37000 J	33000 J	29000 J
4-METHYLPHENOL	350 U	350 U	380 U	350 U	350 U	700 U	700 U	7200 UJ	5350 UJ	3500 UJ
DIBENZOFURAN	350 U	350 U	380 U	350 U	350 U	700 U	700 U	7200 UJ	850 J	850 J
DIMETHYL PHTHALATE	40 J	350 U	380 U	350 U	350 U	700 U	700 U	7200 UJ	5350 UJ	3500 UJ
FLUORENE	350 U	350 U	380 U	350 U	350 U	79 J	700 U	7200 UJ	570 J	570 J
NAPHTHALENE	350 U	350 U	380 U	350 U	350 U	720	700 U	16000 J	15000 J	14000 J
PHENANTHRENE	350 U	350 U	380 U	350 U	350 U	700 U	700 U	7200 UJ	5350 UJ	3500 UJ
PHENOL	350 U	350 U	380 U	350 U	350 U	700 U	700 U	7200 UJ	5350 UJ	3500 UJ
Pesticides PCBs (ug/kg)										
4,4'-DDD	3.5 UJ	4.1 J	3.8 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.55 UJ	3.5 UJ
Inorganics (mg/kg)										
ALUMINUM	3290	1940	2560	6280	947	1830	2330	2630	1745	860
ARSENIC	1.6 J	1.1 J	2.2 J	1.6 J	0.6 J	0.78 J	0.66 J	0.65 J	0.615 J	0.58 J
BARIUM	4 J	4.7 J	4.7 J	3.2 J	2 J	2.5 J	7.1 J	2.1 J	1.41 J	0.72 J
BERYLLIUM	0.09 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 J	0.06 U	0.06 U	0.06 U
CALCIUM	43.3 J	52.4 J	35.1 J	7.1 U	6.9 U	7 U	58.2 J	9.4 J	6.45 J	7 U
CHROMIUM	2.9	1.6 J	10.4	5.2	1.7 J	2 J	3.5	3.2	2.3 J	1.4 J
COBALT	0.71 J	0.6 J	0.51 U	0.89 J	0.47 U	0.48 UJ	0.47 UJ	0.47 U	0.475 U	0.48 U
COPPER	2.8 J	0.47 J	0.8 J	1.6 J	0.36 J	0.36 U	7	1.7 J	1.45 J	1.2 J
IRON	3130	1640	5350	4140	810	1490	2410	1590	1059	528
LEAD	1.7	1.4	5.1	0.85	0.45 J	1.5	3.8	1.8	1.7	1.6
MAGNESIUM	30.1 J	44.6 J	26.1 J	52.5 J	23.4 J	39 J	151 J	39.5 J	26.2 J	12.9 J
MANGANESE	18.4	14.8	16.2	11.1	8.3	6.4	16.7	6.4	4.6 J	2.8 J
MERCURY	0.05	0.04 J	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 J	0.02 U	0.02 U	0.02 U
NICKEL	3 U	2.9 J	2.8 U	2.7 U	2.6 U	2.6 U	2.6 U	2.6 U	2.65 U	2.7 U
POTASSIUM	125 U	109 U	637 J	119 J	108 U	109 U	109 J	471 J	341 J	211
SELENIUM	0.52 U	0.45 U	0.79 U	0.46 U	0.45 U	0.45 U	0.45 U	0.44 U	0.445 U	0.45 U
SODIUM	13.5 U	11.8 U	12.6 U	12 U	11.6 U	11.8 U	11.7 U	13.3 J	9.6 J	11.8 U
VANADIUM	6.2 J	2.9 J	23.9	11	1.4 J	3.6 J	4.3 J	6.9 J	4.45 J	2 J
ZINC	2.1 J	2.1 J	0.84 J	2.4 J	1.1 J	2 J	4.5	1.6 J	1.165 J	0.73 J
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.6 J	0.52 J	0.43 J	0.5 J	0.75 J	0.49 J	0.7 J	0.43 J	0.425 J	0.42 J
Petroleum Hydrocarbon (mg/kg)										
TOTAL PETROLEUM HYDROCARBONS	1.8 U	2.3	1.9 U	2660	3.6	1250	544	5420	6305	7190

APPENDIX TABLE A-10-6
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (2-15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA
PAGE 2 OF 2

SITE	0018	0018	0018	0018	0018	0018	0018
LOCATION	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB6-5-7	18SB7-5-7	18SB8-10-12	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7-D	18SB9-5-7
SAMPLE	18SB6-5-7	18SB7-5-7	18SB8-10-12	18SB8-5-7	18SB8-5-7-AVG	18SB8-5-7A	18SB9-5-7
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	5 - 7
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/4/1993	1/4/1993	1/4/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)							
2-BUTANONE	21 J	11 U	7100 UJ	12	9 J	6 J	11 UJ
4-METHYL-2-PENTANONE	55 U	11 U	7100 U	17	11.5 J	6 J	11 UJ
ACETONE	55 U	11 U	7100 UJ	11 U	11 U	11 U	11 U
TOTAL XYLENES	55 U	11 U	800 J	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	830	350 U	910	86 J	86 J	370 U	360 U
4-METHYLPHENOL	110 J	350 U	380 U	250 J	265 J	280 J	360 U
DIBENZOFURAN	360 U	350 U	380 U	370 U	370 U	370 U	360 U
DIMETHYL PHTHALATE	360 U	350 U	380 U	370 U	370 U	370 U	360 U
FLUORENE	360 U	350 U	56 J	370 U	370 U	370 U	360 U
NAPHTHALENE	230 J	350 U	380 U	370 U	370 U	370 U	360 U
PHENANTHRENE	42 J	350 U	58 J	370 U	370 U	370 U	360 U
PHENOL	360 U	350 U	380 U	89 J	94.5 J	100 J	360 U
Pesticides PCBs (ug/kg)							
4,4'-DDD	3.6 UJ	3.5 UJ	3.8 UJ	3.7 UJ	3.7 UJ	3.7 UJ	3.6 UJ
Inorganics (mg/kg)							
ALUMINUM	4530	4680	2480	10000 J	6830 J	3660 J	5910
ARSENIC	1.2 J	0.9 J	1 J	3.5 J	3.2 J	2.9 J	3
BARIUM	5.2 J	4.7 J	4.7 J	7.6 J	6.75 J	5.9 J	7.8 J
BERYLLIUM	0.06 U	0.07 J	0.06 U	0.09 J	0.09 J	0.09 J	0.07 J
CALCIUM	180 J	7.3 J	17.6 J	27.2 UJ	25.25 UJ	23.3 UJ	9.9 J
CHROMIUM	6.2	4.5	8.6	7.9	5.85	3.8	4.9
COBALT	0.71 J	0.61 J	0.51 U	1 J	0.765 J	0.53 J	0.88 J
COPPER	4.1 J	1.7 J	0.5 J	1.3 UJ	1.2 UJ	1.1 UJ	1.4 J
IRON	4570	3020	4000	8620 J	6405 J	4190 J	4640
LEAD	4.9	1.6	4.7	4.8 J	4.25 J	3.7 J	11.1
MAGNESIUM	99.2 J	73.6 J	19.2 J	48.6 UJ	32.2 UJ	15.8 UJ	87.6 J
MANGANESE	63	22.1	2.9 J	18	13.45	8.9	23.2
MERCURY	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
NICKEL	2.7 U	2.7 J	2.8 U	2.8 U	2.8 U	2.8 U	2.7 U
POTASSIUM	873 J	109 U	1230	1150	1185	1220	312 J
SELENIUM	0.47 U	0.53 U	0.8 U	1.4 J	1.2 J	1 J	0.54 U
SODIUM	29.8 J	11.8 U	17.6 J	32.6 UJ	30.65 UJ	28.7 UJ	12.2 U
VANADIUM	14.1	8.4 J	15.8	21.5	16.7	11.9	10.3 J
ZINC	1.4 J	2.9 J	0.58 J	2.4 UJ	1.66 UJ	0.92 UJ	3.1 J
Miscellaneous Parameters (mg/kg)							
CYANIDE	0.44 J	0.41 J	0.41 J	0.44 UJ	0.445 UJ	0.45 UJ	3.3
Petroleum Hydrocarbon (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	901	42.4	671	481	303.5	126	31.7

APPENDIX TABLE A-10-7
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL (>15 FT)
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SB-02	18-SB-02	18-SB-04	18-SB-04	18-SB-04	18-SB-04	WHF-18-SB-6	WHF-18-SB-6	18-SB-07	WHF-18-SB-8	18-SB-09
NSAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SAMPLE	18SB2-15-17	18SB2-20-22	18SB4-15-17	18SB4-25-27	18SB4-35-37	18SB4-40-42	18SB6-15-17	18SB6-20-22	18SB7-15-17	18SB8-15-17	18SB9-15-17
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	15 - 17	20 - 22	15 - 17	25 - 27	35 - 37	40 - 42	15 - 17	20 - 22	15 - 17	15 - 17	15 - 17
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/5/1993	1/5/1993	1/6/1993	1/6/1993	1/6/1993	1/6/1993	1/5/1993	1/5/1993	1/5/1993	1/4/1993	1/5/1993
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)											
ACETONE	6600 UJ	77	1300 UJ	210	31 UJ	54 UJ	20	10 J	150	1400 UJ	93
Semivolatile Organics (ug/kg)											
2-METHYLNAPHTHALENE	370 U	370 U	3100	360 U	350 U	440 U	350 U	340 U	360 U	170 J	350 U
DIBENZOFURAN	370 U	370 U	690 U	360 U	350 U	440 U	63 J	340 U	360 U	370 U	350 U
NAPHTHALENE	370 U	370 U	1100	360 U	350 U	440 U	680	340 U	360 U	370 U	350 U
Pesticides PCBs (ug/kg)											
4,4'-DDE	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	5.5 J	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
4,4'-DDT	3.7 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.5 UJ	21 J	3.5 UJ	3.4 UJ	3.6 UJ	3.7 UJ	3.5 UJ
Inorganics (mg/kg)											
ALUMINUM	1640	2010	1170	1360	382	11100	1000	1020	2010	8460	1430
ARSENIC	0.63 J	1.2 J	0.56 J	0.5 J	0.21 U	2 J	0.33 UJ	0.21 UJ	0.65 J	1.7 J	0.57 J
BARIUM	1 J	2.1 J	1.6 J	4.1 J	1.2 J	33.3 J	0.66 J	0.46 J	0.55 J	5.6 J	0.8 J
BERYLLIUM	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.14 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
CALCIUM	7 U	14.7 J	6.9 U	7.5 U	6.9 U	141 J	6.9 U	6.8 U	7 U	21.5 J	14.6 J
CHROMIUM	2.2	2.7	2.3	2.9	1.2 J	39.7	1.4 J	1.8 J	2.7	9.5	1.6 J
COBALT	0.86 J	0.49 U	0.47 UJ	0.51 UJ	0.47 UJ	0.59 UJ	0.47 U	0.47 U	0.48 U	0.92 J	0.48 U
COPPER	0.82 J	0.37 U	0.35 U	0.38 U	0.35 U	3 J	0.35 U	0.42 J	0.36 U	1.1 J	0.56 J
IRON	1200	1890	933	431	225	4360	633	558	1250	7610	873
LEAD	0.12 U	0.67	0.97	2	0.34 J	14.5	0.63	0.3 J	1.4	2.9	1
MAGNESIUM	16.5 J	11.1 J	19.9 J	16.5 J	7.5 U	300 J	8.9 J	7.4 U	7.7 U	52.3 J	7.5 U
MANGANESE	4.6	7.1	2.8 J	1.6 J	0.44 J	7.3	1.1 J	0.77 J	2.4 J	15.5	2 J
MERCURY	0.02 U	0.02 U	0.02 UJ	0.02 UJ	0.02 UJ	0.1 J	0.02 U	0.02 U	0.02 U	0.02 U	0.05
POTASSIUM	109 U	112 U	110 J	117 U	108 U	823 J	189 J	107 U	110 U	841 J	202 J
SELENIUM	0.45 U	0.47 U	0.45 U	0.58 U	0.45 U	1.1 J	0.45 U	0.44 U	0.46 U	0.79 U	0.45 U
SILVER	0.52 U	0.53 U	0.51 U	0.55 U	0.51 U	0.63 U	0.51 U	0.5 U	0.52 U	0.57 J	0.51 U
SODIUM	11.9 U	12.1 U	11.6 U	12.6 U	11.6 U	25.6 J	11.6 U	11.6 U	11.9 U	16.3 J	11.8 U
VANADIUM	3.3 J	7.9 J	2.3 J	4.6 J	1.2 J	39.9	2.4 J	2.5 J	4.3 J	23.3	3.2 J
ZINC	0.78 J	0.65 J	2.3 J	0.67 J	1 J	2.3 J	1.1 J	1.2 J	0.63 J	13.1	0.93 J
Miscellaneous Parameters (mg/kg)											
CYANIDE	0.55 J	0.27 J	0.56 J	0.57 J	0.53 J	0.7 J	0.44 J	0.38 J	0.42 J	0.41 J	0.51 J
Petroleum Hydrocarbon (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS	298	4.9	612	41.2	1.7 U	2.1 U	311	2.4	7.3	535	10.3

APPENDIX TABLE A-10-8
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL TCLP ANALYSES
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018	0018
LOCATION	18-SL-01	18-SL-06	18-SL-07	18-SL-08	18-SL-09	18-SL-10	18-SL-23	18-SL-25	18-SL-31	18-SL-37	18-SL-38	18-SL-40
NSAMPLE	18-SL-01TCLP	18-SL-06TCLP	18-SL-07TCLP	18-SL-08TCLP	18-SL-09TCLP	18-SL-10TCLP	18-SL-23TCLP	18-SL-25TCLP	18-SL-31TCLP	18-SL-37TCLP	18-SL-38TCLP	18-SL-40TCLP
SAMPLE	18-SL-01TCLP	18-SL-06TCLP	18-SL-07TCLP	18-SL-08TCLP	18-SL-09TCLP	18-SL-10TCLP	18-SL-23TCLP	18-SL-25TCLP	18-SL-31TCLP	18-SL-37TCLP	18-SL-38TCLP	18-SL-40TCLP
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH RANGE	---	---	---	---	---	---	---	---	---	---	---	---
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/12/1992	8/14/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/13/1992	8/14/1992	8/14/1992	8/14/1992	8/14/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
TCLP Volatile Organic (ug/L)												
2-BUTANONE	50 U	50 U	50 U	50 U	50 U	50 U	50 U	47 J	50 U	50 U	50 U	50 U
TCLP Metals (ug/L)												
ARSENIC	25.3 UJ	25.3 U	25.3 UJ	25.3 UJ	25.3 UJ	25.3 U	25.3 U	25.3 UJ	45.2 J	25.3 UJ	25.3 UJ	25.3 UJ
BARIUM	1490	1000	1380	3770	1300	1510	1980	684	3380	893	681	888
CADMIUM	2250	136	407	6.7	5 J	5.8	186	2.7 U	67.8	9 UJ	2.7 U	4.5 UJ
CHROMIUM	6.2 J	8.8 J	6.7 J	1.9 U	1.9 U	1.9 UJ	10.3 J	1.9 U	49.7	1.9 UJ	5.7 J	2.7 J
LEAD	450	259	474	152	142	599	70	256	4630	734	44.7 J	4610
MERCURY	0.2	0.03 U	0.26	0.21	0.16 U	0.19 UJ	0.17 UJ	0.14 J	0.27 UJ	0.16 UJ	0.25 UJ	0.29 UJ

APPENDIX TABLE A-10-9
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	6/47	17 J	1700	11 - 1500	104	326	18-SL-27
ACETONE	2/47	340 J	1400 J	11 - 1500	117	528	18-SL-37
CARBON DISULFIDE	8/47	1 J	11 J	5 - 740	35.4	5.06	18-SL-31-D
ETHYLBENZENE	10/47	15 J	800	5 - 32	54.8	239	18-SL-33
METHYLENE CHLORIDE	5/47	49 J	86 J	5 - 800	54.8	59.6	18-SL-32
TOLUENE	11/47	1 J	390 J	5 - 690	36.4	107	18-SL-33
TOTAL XYLENES	32/47	1 J	7000	5 - 32	409	598	18-SL-33
TCLP Volatiles (ug/L)							
2-BUTANONE, TCLP	1/12	47 J	47 J	50	26.8	47.0	18-SL-25TCLP
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	9/47	1100 J	33000 J	350 - 19000	3467	14044	18-SL-27
BENZO(A)ANTHRACENE	1/47	1300 J	1300 J	350 - 20000	1488	1300	18-SL-23
BENZO(A)PYRENE	1/47	1200 J	1200 J	350 - 20000	1486	1200	18-SL-23
BIS(2-CHLOROETHOXY)METHANE	1/47	440 J	440 J	350 - 20000	1552	440	18-SL-06
BIS(2-ETHYLHEXYL)PHTHALATE	15/47	56 J	5600 J	350 - 20000	1498	818	18-SL-23
CHRYSENE	1/47	1400 J	1400 J	350 - 20000	1490	1400	18-SL-23
FLUORANTHENE	1/47	3500 J	3500 J	350 - 20000	1535	3500	18-SL-23
FLUORENE	1/47	440	440	350 - 20000	1567	440	18-SL-13
NAPHTHALENE	9/47	990	8000 J	350 - 11000	1494	4354	18-SL-33
PHENANTHRENE	3/47	120 J	2200 J	350 - 20000	1470	1017	18-SL-27
PYRENE	3/47	730 J	7700 J	350 - 20000	1417	3260	18-SL-23
Inorganics (mg/kg)							
ALUMINUM	47/47	1510	13500	---	3996	3996	18-SL-31-D
ANTIMONY	5/47	2.9	5.8 J	2.6 - 4.4	1.58	3.00	18-SL-01-D
ARSENIC	35/47	0.24 J	3.1	0.22 - 2.2	0.635	0.681	18-SL-31
BARIUM	47/47	2.5 J	290	---	26.5	26.5	18-SL-31-D
BERYLLIUM	23/47	0.06 J	0.14 J	0.05 - 0.09	0.0507	0.0749	18-SL-31-D
CADMIUM	23/47	0.6 J	38.8	0.58 - 0.72	3.13	6.08	18-SL-42
CALCIUM	36/47	63 J	1050 J	102 - 786	168	187	18-SL-20
CHROMIUM	47/47	1.5 J	95.7 J	---	9.02	9.02	18-SL-10
COBALT	29/47	0.4 J	5.9 J	0.34 - 4.8	0.846	1.08	18-SL-31-D
COPPER	44/47	1.8 J	864	2.3 - 4.5	35.5	37.8	18-SL-01-D
IRON	47/47	1140	51700	---	4229	4229	18-SL-31-D
LEAD	43/47	3.2	168	4.6 - 16.1	31.7	34.1	18-SL-31-D
MAGNESIUM	47/47	33.8 J	657 J	---	116	116	18-SL-31-D
MANGANESE	47/47	12.1	457	---	57.0	57.0	18-SL-31-D
MERCURY	14/47	0.04 J	0.25	0.01 - 0.12	0.0438	0.0850	18-SL-23
NICKEL	23/47	2.5 J	19.7	2.3 - 11.4	2.91	4.63	18-SL-31-D
POTASSIUM	32/47	138 J	2930	129 - 158	261	351	18-SL-31-D
SILVER	1/47	0.35 J	0.35 J	0.32 - 0.7	0.176	0.350	18-SL-03
SODIUM	36/47	137 J	302 J	127 - 270	162	185	18-SL-31-D
THALLIUM	1/47	0.53 J	0.53 J	0.34 - 0.73	0.205	0.530	18-SL-43

APPENDIX TABLE A-10-9
SUMMARY OF DESCRIPTIVE STATISTICS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
VANADIUM	46/47	2.4 J	12.1	3.5 - 3.6	5.07	5.14	18-SL-42
ZINC	39/47	4.3 J	779	7.3 - 77	46.0	52.2	18-SL-31-D
Petroleum Hydrocarbons (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	38/47	2.9	23500	1.7 - 1.9	4965	6140	18-SL-15
TCLP Metals (ug/L)							
ARSENIC, TCLP	1/12	45.2 J	45.2 J	25.3	15.4	45.2	18-SL-31TCLP
BARIUM, TCLP	12/12	681	3770	---	1580	1580	18-SL-08TCLP
CADMIUM, TCLP	8/12	5 J	2250	2.7 - 9	256	383	18-SL-01TCLP
CHROMIUM, TCLP	7/12	2.7 J	49.7	1.9	7.90	12.9	18-SL-31TCLP
LEAD, TCLP	12/12	44.7 J	4630	---	1035	1035	18-SL-31TCLP
MERCURY, TCLP	4/12	0.14 J	0.26	0.03 - 0.29	0.131	0.203	18-SL-07TCLP

APPENDIX TABLE A-10-10
SUMMARY OF DESCRIPTIVE STATISTICS - SHALLOW SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
2-BUTANONE	2/13	6 J	21 J	10 - 7100	632	15.0	18SB6-5-7
4-METHYL-2-PENTANONE	2/13	3 J	17	10 - 7100	633	7.25	18SB8-5-7
ACETONE	4/13	24	130	11 - 7100	647	59.5	18SB10-5-7
TOTAL XYLENES	3/13	16	8700	10 - 1300	720	2655	18SB6-10-12
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	6/13	86 J	37000 J	350 - 380	2980	6249	18SB6-10-12
4-METHYLPHENOL	2/13	110 J	280 J	350 - 7200	399	188	18SB8-5-7-D
DIBENZOFURAN	1/13	850 J	850 J	350 - 7200	258	850	18SB6-10-12-D
DIMETHYL PHTHALATE	1/13	40 J	40 J	350 - 7200	388	40.0	18SB1-10-12
FLUORENE	3/13	56 J	570 J	350 - 7200	205	235	18SB6-10-12-D
NAPHTHALENE	3/13	230 J	16000 J	350 - 700	1378	5317	18SB6-10-12
PHENANTHRENE	2/13	42 J	58 J	350 - 7200	377	50.0	18SB8-10-12
PHENOL	1/13	89 J	100 J	350 - 7200	391	94.5	18SB8-5-7-D
Pesticides PCBs (ug/kg)							
4,4'-DDD	1/13	4.1 J	4.1 J	3.5 - 3.8	1.97	4.10	18SB1-5-7
Inorganics (mg/kg)							
ALUMINUM	13/13	860	10000 J	---	3489	3489	18SB8-5-7
ARSENIC	13/13	0.58 J	3.5 J	---	1.42	1.42	18SB8-5-7
BARIUM	13/13	0.72 J	7.8 J	---	4.52	4.52	18SB9-5-7
BERYLLIUM	5/13	0.06 J	0.09 J	0.06	0.0477	0.0760	18SB8-5-7, 18SB8-5-7-D, 18SB1-10-12
CALCIUM	9/13	7.3 J	180 J	6.9 - 27.2	33.3	45.6	18SB6-5-7
CHROMIUM	13/13	1.4 J	10.4	---	4.59	4.59	18SB10-5-7
COBALT	7/13	0.53 J	1 J	0.47 - 0.51	0.509	0.738	18SB8-5-7
COPPER	11/13	0.36 J	7	0.36 - 1.3	1.77	2.02	18SB4-5-7
IRON	13/13	528	8620 J	---	3282	3282	18SB8-5-7
LEAD	13/13	0.45 J	11.1	---	3.31	3.31	18SB9-5-7
MAGNESIUM	12/13	12.9 J	151 J	15.8 - 48.6	53.0	56.0	18SB4-5-7
MANGANESE	13/13	2.8 J	63	---	17.0	17.0	18SB6-5-7
MERCURY	3/13	0.02 J	0.05	0.02	0.0162	0.0367	18SB1-10-12
NICKEL	2/13	2.7 J	2.9 J	2.6 - 3	1.58	2.80	18SB1-5-7
POTASSIUM	8/13	109 J	1230	108 - 125	391	601	18SB8-10-12
SELENIUM	1/13	1 J	1.4 J	0.44 - 0.8	0.337	1.20	18SB8-5-7
SODIUM	3/13	13.3 J	29.8 J	11.6 - 32.6	9.76	19.0	18SB6-5-7
VANADIUM	13/13	1.4 J	23.9	---	9.47	9.47	18SB10-5-7
ZINC	12/13	0.58 J	4.5	0.92 - 2.4	1.92	2.02	18SB4-5-7
Miscellaneous Parameter (mg/kg)							
CYANIDE	12/13	0.41 J	3.3	0.44 - 0.45	0.708	0.748	18SB9-5-7
Petroleum Hydrocarbon (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	11/13	2.3	7190	1.8 - 1.9	978	1156	18SB6-10-12-D

APPENDIX TABLE A-10-11
SUMMARY OF DESCRIPTIVE STATISTICS - DEEP SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive Hits	Sample of Maximum Detection
Volatile Organics (ug/kg)							
ACETONE	6/11	10 J	210	31 - 6600	478	93.3	18SB4-25-27
Semivolatile Organics (ug/kg)							
2-METHYLNAPHTHALENE	2/11	170 J	3100	340 - 440	447	1635	18SB4-15-17
DIBENZOFURAN	1/11	63 J	63 J	340 - 690	188	63.0	18SB6-15-17
NAPHTHALENE	2/11	680	1100	340 - 440	312	890	18SB4-15-17
Pesticides PCBs (ug/kg)							
4,4'-DDE	1/11	5.5 J	5.5 J	3.4 - 3.7	2.12	5.50	18SB4-40-42
4,4'-DDT	1/11	21 J	21 J	3.4 - 3.7	3.53	21.0	18SB4-40-42
Inorganics (mg/kg)							
ALUMINUM	11/11	382	11100	---	2871	2871	18SB4-40-42
ARSENIC	8/11	0.5 J	2 J	0.21 - 0.33	0.744	0.976	18SB4-40-42
BARIUM	11/11	0.46 J	33.3 J	---	4.67	4.67	18SB4-40-42
BERYLLIUM	1/11	0.14 J	0.14 J	0.06	0.0400	0.140	18SB4-40-42
CALCIUM	4/11	14.6 J	141 J	6.8 - 7.5	19.7	48.0	18SB4-40-42
CHROMIUM	11/11	1.2 J	39.7	---	6.18	6.18	18SB4-40-42
COBALT	2/11	0.86 J	0.92 J	0.47 - 0.59	0.363	0.890	18SB8-15-17
COPPER	5/11	0.42 J	3 J	0.35 - 0.38	0.635	1.18	18SB4-40-42
IRON	11/11	225	7610	---	1815	1815	18SB8-15-17
LEAD	10/11	0.3 J	14.5	0.12	2.25	2.47	18SB4-40-42
MAGNESIUM	7/11	8.9 J	300 J	7.4 - 7.7	40.0	60.7	18SB4-40-42
MANGANESE	11/11	0.44 J	15.5	---	4.15	4.15	18SB8-15-17
MERCURY	2/11	0.05	0.1 J	0.02	0.0218	0.0750	18SB4-40-42
POTASSIUM	5/11	110 J	841 J	107 - 117	227	433	18SB8-15-17
SELENIUM	1/11	1.1 J	1.1 J	0.44 - 0.79	0.327	1.10	18SB4-40-42
SILVER	1/11	0.57 J	0.57 J	0.5 - 0.63	0.292	0.570	18SB8-15-17
SODIUM	2/11	16.3 J	25.6 J	11.6 - 12.6	8.66	21.0	18SB4-40-42
VANADIUM	11/11	1.2 J	39.9	---	8.63	8.63	18SB4-40-42
ZINC	11/11	0.63 J	13.1	---	2.24	2.24	18SB8-15-17
Miscellaneous Parameters (mg/kg)							
CYANIDE	11/11	0.27 J	0.7 J	---	0.485	0.485	18SB4-40-42
Petroleum Hydrocarbon (mg/kg)							
TOTAL PETROLEUM HYDROCARBONS	9/11	2.4	612	1.7 - 2.1	166	202	18SB4-15-17

APPENDIX TABLE A-10-12
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	Recommended UCL to Use	
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness			
Volatile Organics (ug/kg)											
2-BUTANONE	47	6	17.0	1700	104	326	298	4.06	Data is Undefined	536	99% Chebyshev(MVUE) UCL
ACETONE	47	2	340	717	117	528	220	2.24	Data is Undefined	437	99% Chebyshev(MVUE) UCL
CARBON DISULFIDE	47	8	1.00	11.0	35.4	5.06	96.8	3.07	Data is Undefined	11.0	Maximum Detected Concentration
ETHYLBENZENE	47	10	15.0	800	54.8	239	142	3.89	Data is Undefined	261	99% Chebyshev(MVUE) UCL
METHYLENE CHLORIDE	47	5	37.0	86.0	54.8	59.6	100.0	2.71	Data is Undefined	86.0	Maximum Detected Concentration
TOLUENE	47	11	1.00	390	36.4	107	85.1	3.09	Data is Undefined	160	99% Chebyshev(MVUE) UCL
TOTAL XYLENES	47	32	1.00	7000	409	598	1218	4.14	Data is Undefined	2177	99% Chebyshev(Mean, Std) UCL
Semivolatile Organics (ug/kg)											
2-METHYLNAPHTHALENE	47	9	1100	33000	3467	14044	6967	2.73	Data is Undefined	13578	99% Chebyshev(MVUE) UCL
BENZO(A)ANTHRACENE	47	1	1300	1300	1488	1300	2323	2.41	Data is Undefined	1300	Maximum Detected Concentration
BENZO(A)PYRENE	47	1	1200	1200	1486	1200	2323	2.41	Data is Undefined	1200	Maximum Detected Concentration
BIS(2-CHLOROETHOXY)METHANE	47	1	440	440	1552	440	2375	2.23	Data is Undefined	440	Maximum Detected Concentration
BIS(2-ETHYLHEXYL)PHTHALATE	47	15	56.0	4850	1498	818	2405	2.21	Data is Undefined	4850	Maximum Detected Concentration
CHRYSENE	47	1	1400	1400	1490	1400	2323	2.40	Data is Undefined	1400	Maximum Detected Concentration
FLUORANTHENE	47	1	3500	3500	1535	3500	2341	2.30	Data is Undefined	3500	Maximum Detected Concentration
FLUORENE	47	1	440	440	1567	440	2368	2.23	Data is Undefined	440	Maximum Detected Concentration
NAPHTHALENE	47	9	990	8000	1494	4354	2027	1.80	Data is Undefined	4435	99% Chebyshev(MVUE) UCL
PHENANTHRENE	47	3	120	2200	1470	1017	2330	2.42	Data is Undefined	2200	Maximum Detected Concentration
PYRENE	47	3	730	6950	1417	3260	2156	2.31	Data is Undefined	4547	99% Chebyshev(MVUE) UCL
Inorganics (mg/kg)											
ALUMINUM	47	47	1510	10300	3996	3996	1714	1.95	Data is Lognormal	4415	Student-t
ANTIMONY	47	5	2.13	3.63	1.58	3.00	0.548	2.91	Data is Undefined	1.72	Student-t
ARSENIC	47	35	0.240	2.65	0.635	0.681	0.397	3.29	Data is Lognormal	0.733	H-UCL
BARIUM	47	47	2.50	278	26.5	26.5	48.7	4.05	Data is Undefined	97.1	99% Chebyshev(MVUE) UCL
BERYLLIUM	47	23	0.053	0.110	0.051	0.075	0.026	0.473	Data is Undefined	0.067	95% Chebyshev(Mean, Std) UCL
CADMIUM	47	23	0.508	38.8	3.13	6.08	7.49	3.59	Data is Undefined	14.0	99% Chebyshev(MVUE) UCL
CALCIUM	47	36	63.0	1050	168	187	158	4.12	Data is Undefined	268	95% Chebyshev(Mean, Std) UCL
CHROMIUM	47	47	1.50	53.0	9.02	9.02	11.0	2.53	Data is Undefined	16.0	95% Chebyshev(Mean, Std) UCL
COBALT	47	29	0.400	4.15	0.846	1.08	0.707	2.47	Gamma Distribution	1.02	Approximate Gamma 95% UCL
COPPER	47	44	1.80	521	35.5	37.8	88.5	4.26	Data is Undefined	164	99% Chebyshev(MVUE) UCL
IRON	47	47	1140	46650	4229	4229	7531	4.65	Data is Undefined	9018	95% Chebyshev(Mean, Std) UCL
LEAD	47	43	3.20	164	31.7	34.1	31.5	1.97	Gamma Distribution	40.6	Approximate Gamma 95% UCL
MAGNESIUM	47	47	33.8	588	116	116	87.3	4.03	Data is Undefined	138	Student-t
MANGANESE	47	47	12.1	383	57.0	57.0	64.7	3.32	Data is Lognormal	71.1	H-UCL
MERCURY	47	14	0.050	0.190	0.044	0.085	0.037	2.05	Gamma Distribution	0.054	Approximate Gamma 95% UCL
NICKEL	47	23	2.50	12.7	2.91	4.63	2.70	2.32	Data is Undefined	4.62	95% Chebyshev(Mean, Std) UCL
POTASSIUM	47	32	138	2895	261	351	430	5.39	Data is Undefined	534	95% Chebyshev(Mean, Std) UCL
SILVER	47	1	0.350	0.350	0.176	0.350	0.034	3.86	Data is Undefined	0.185	Student-t
SODIUM	47	36	127	279	162	185	52.3	-0.134	Data is Normal	175	Student-t
THALLIUM	47	1	0.530	0.530	0.205	0.530	0.060	4.03	Data is Undefined	0.219	Student-t
VANADIUM	47	46	2.40	12.1	5.07	5.14	1.90	1.35	Gamma Distribution	5.55	Approximate Gamma 95% UCL
ZINC	47	39	4.30	553	46.0	52.2	102	3.98	Data is Undefined	194	99% Chebyshev(MVUE) UCL
Petroleum Hydrocarbon (mg/kg)											
TOTAL PETROLEUM HYDROCARBONS	47	38	2.90	23500	4965	6140	7069	1.15	Data is Undefined	6771	Hall's Botstrap UCL*

APPENDIX TABLE A-10-12
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	Recommended UCL to Use
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness		

Bolded shaded values indicate that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

Associated Samples

18-SL-01-AVG	18-SL-09	18-SL-17	18-SL-25	18-SL-33	18-SL-41
18-SL-02	18-SL-10-AVG	18-SL-18	18-SL-26	18-SL-34	18-SL-42
18-SL-03	18-SL-11	18-SL-19	18-SL-27	18-SL-35	18-SL-43
18-SL-04	18-SL-12	18-SL-20	18-SL-28	18-SL-36	18-SL-44
18-SL-05	18-SL-13	18-SL-21	18-SL-29	18-SL-37-AVG	18-SL-45
18-SL-06	18-SL-14	18-SL-22	18-SL-30	18-SL-38	18-SL-46
18-SL-07	18-SL-15	18-SL-23-AVG	18-SL-31-AVG	18-SL-39	18-SL-47
18-SL-08	18-SL-16	18-SL-24	18-SL-32	18-SL-40	

APPENDIX TABLE A-10-13
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SHALLOW SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Normal Statistics									Shapiro-Wilk/Lilliefors Test Statistic		Recommended UCL to Use	
	Number of Samples	Number of Detections	Frequency of Detection	Minimun Detected	Maximum Detected	Mean of all Samples	Mean of Positive Detections	Standard Deviation	Skewness	Distribution Test	Distribution		
Volatile Organics (ug/kg)													
2-BUTANONE	13	2	15%	9.00	21.0	632	15.0	1258	2.04	Shapiro-Wilk	Undefined	21.0	Maximum Detected Concentration
4-METHYL-2-PENTANONE	13	2	15%	3.00	11.5	633	7.25	1257	2.04	Shapiro-Wilk	Undefined	11.5	Maximum Detected Concentration
ACETONE	13	4	31%	24.0	130	647	59.5	1250	2.04	Shapiro-Wilk	Lognormal	130	Maximum Detected Concentration
TOTAL XYLENES	13	3	23%	16.0	7150	720	2655	1955	3.46	Shapiro-Wilk	Undefined	1555	Non-Parametric UCL
Semivolatile Organics (ug/kg)													
2-METHYLNAPHTHALENE	13	6	46%	86.0	33000	2980	6249	9033	3.59	Shapiro-Wilk	Undefined	7133	Non-Parametric UCL
4-METHYLPHENOL	13	2	15%	110	265	399	188	688	3.54	Shapiro-Wilk	Undefined	265	Maximum Detected Concentration
DIBENZOFURAN	13	1	8%	850	850	258	850	189	2.99	Shapiro-Wilk	Undefined	338	Non-Parametric UCL
DIMETHYL PHTHALATE	13	1	8%	40.0	40.0	388	40.0	692	3.52	Shapiro-Wilk	Undefined	40.0	Maximum Detected Concentration
FLUORENE	13	3	23%	56.0	570	205	235	129	2.13	Shapiro-Wilk	Undefined	263	Non-Parametric UCL
NAPHTHALENE	13	3	23%	230	15000	1378	5317	4096	3.60	Shapiro-Wilk	Undefined	3249	Non-Parametric UCL
PHENANTHRENE	13	2	15%	42.0	58.0	377	50.0	696	3.51	Shapiro-Wilk	Undefined	58.0	Maximum Detected Concentration
PHENOL	13	1	8%	94.5	94.5	391	94.5	690	3.54	Shapiro-Wilk	Undefined	94.5	Maximum Detected Concentration
Pesticides PCBs (ug/kg)													
4,4'-DDD	13	1	8%	4.10	4.10	1.97	4.10	0.642	3.56	Shapiro-Wilk	Undefined	2.25	Non-Parametric UCL
Inorganics (mg/kg)													
ALUMINUM	13	13	100%	947	6830	3489	3489	1942	0.574	Shapiro-Wilk	Normal/Lognormal	5237	H-UCL
ARSENIC	13	13	100%	0.600	3.20	1.42	1.42	0.878	1.17	Shapiro-Wilk	Lognormal	2.05	H-UCL
BARIUM	13	13	100%	1.41	7.80	4.52	4.52	1.94	0.096	Shapiro-Wilk	Normal/Lognormal	6.31	H-UCL
BERYLLIUM	13	5	38%	0.060	0.090	0.048	0.076	0.025	0.874	Shapiro-Wilk	Undefined	0.0589	Non-Parametric UCL
CALCIUM	13	9	69%	6.45	180	33.3	45.6	48.2	2.67	Shapiro-Wilk	Lognormal	85.5	95% Chebyshev(MVUE) UCL
CHROMIUM	13	13	100%	1.60	10.4	4.59	4.59	2.70	0.901	Shapiro-Wilk	Normal/Lognormal	6.95	H-UCL
COBALT	13	7	54%	0.600	0.890	0.509	0.738	0.270	0.134	Shapiro-Wilk	Undefined	0.624	Non-Parametric UCL
COPPER	13	11	85%	0.360	7.00	1.77	2.02	1.92	2.00	Shapiro-Wilk	Lognormal	4.15	95% Chebyshev(MVUE) UCL
IRON	13	13	100%	810	6405	3282	3282	1746	0.148	Shapiro-Wilk	Normal/Lognormal	5287	H-UCL
LEAD	13	13	100%	0.450	11.1	3.31	3.31	2.87	1.76	Shapiro-Wilk	Lognormal	6.82	H-UCL
MAGNESIUM	13	12	92%	19.2	151	53.0	56.0	39.8	1.45	Shapiro-Wilk	Lognormal	85.7	H-UCL
MANGANESE	13	13	100%	2.90	63.0	17.0	17.0	15.2	2.54	Shapiro-Wilk	Lognormal	30.8	H-UCL
MERCURY	13	3	23%	0.020	0.050	0.016	0.037	0.013	2.12	Shapiro-Wilk	Undefined	0.0219	Non-Parametric UCL
NICKEL	13	2	15%	2.70	2.90	1.58	2.80	0.545	2.16	Shapiro-Wilk	Undefined	1.83	Non-Parametric UCL
POTASSIUM	13	8	62%	109	1230	391	601	443	1.12	Shapiro-Wilk	Undefined	594	Non-Parametric UCL
SELENIUM	13	1	8%	1.20	1.20	0.337	1.20	0.267	3.29	Shapiro-Wilk	Undefined	0.452	Non-Parametric UCL
SODIUM	13	3	23%	9.60	29.8	9.76	19.0	7.18	2.20	Shapiro-Wilk	Undefined	12.9	Non-Parametric UCL
VANADIUM	13	13	100%	1.40	23.9	9.47	9.47	6.66	0.813	Shapiro-Wilk	Normal/Lognormal	18.5	H-UCL
ZINC	13	12	92%	0.580	4.50	1.92	2.02	1.12	0.961	Shapiro-Wilk	Normal/Lognormal	2.90	H-UCL
Miscellaneous Parameters (mg/kg)													
CYANIDE	13	12	92%	0.410	3.30	0.708	0.748	0.791	3.42	Shapiro-Wilk	Undefined	1.04	Non-Parametric UCL
Petroleum Hydrocarbon (mg/kg)													
TOTAL PETROLEUM HYDROCARBONS	13	11	85%	2.30	6305	978	1156	1770	2.67	Shapiro-Wilk	Lognormal		Needs Further Investigation

Bolded shaded values indicates that frequency of detection is less than 70 percent.
Standard Bootstrap UCL is presented for the non-parametric UCL.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
B qualified data were evaluated as positive detections.

APPENDIX TABLE A-10-14
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - DEEP SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
ACETONE	**11**	**6**	**10**	**210**	**478**	**93.3**	**968**	**2.95**	**Gamma**	**1627**	**Adjusted Gamma 95% UCL**	**UCL > Max**
2-METHYLNAPHTHALENE	**11**	**2**	**170**	**3100**	**447**	**1635**	**880**	**3.32**	**Non-parametric**	**1603**	**95% Chebyshev(Mean, Std) UCL**	**- -**
DIBENZOFURAN	**11**	**1**	**63**	**63.0**	**188**	**63.0**	**64.9**	**0.893**	**Non-parametric**	**223**	**Student-t or Modified-t UCL**	**UCL > Max**
NAPHTHALENE	**11**	**2**	**680**	**1100**	**312**	**890**	**301**	**2.33**	**Non-parametric**	**708**	**95% Chebyshev(Mean, Std) UCL**	**- -**
4,4'-DDE	**11**	**1**	**5.5**	**5.50**	**2.12**	**5.50**	**1.12**	**3.30**	**Non-parametric**	**2.74**	**Student-t or Modified-t UCL**	**Max ND > UCL**
4,4'-DDT	**11**	**1**	**21**	**21.0**	**3.53**	**21.0**	**5.79**	**3.32**	**Non-parametric**	**11.1**	**95% Chebyshev(Mean, Std) UCL**	**- -**
ALUMINUM	11	11	382	11100	2871	2871	3498	1.97	Lognormal	6773	H-UCL	- -
ARSENIC	11	8	0.5	2.00	0.744	0.976	0.632	1.07	Normal	1.09	Student-t	- -
BARIUM	11	11	0.46	33.3	4.67	4.67	9.63	3.15	Lognormal	9.54	95% Chebyshev(MVUE) UCL	- -
BERYLLIUM	**11**	**1**	**0.14**	**0.140**	**0.040**	**0.140**	**0.033**	**3.32**	**Non-parametric**	**0.058**	**Student-t or Modified-t UCL**	**Max ND > UCL**
CALCIUM	**11**	**4**	**14.6**	**141**	**19.7**	**48.0**	**40.7**	**3.17**	**Non-parametric**	**142**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max**
CHROMIUM	11	11	1.2	39.7	6.18	6.18	11.4	3.10	Non-parametric	40.2	99% Chebyshev(Mean, Std) UCL	UCL > Max
COBALT	**11**	**2**	**0.86**	**0.920**	**0.363**	**0.890**	**0.261**	**1.92**	**Non-parametric**	**0.707**	**95% Chebyshev(Mean, Std) UCL**	**- -**
COPPER	**11**	**5**	**0.42**	**3.00**	**0.635**	**1.18**	**0.845**	**2.59**	**Non-parametric**	**1.74**	**95% Chebyshev(Mean, Std) UCL**	**- -**
IRON	11	11	225	7610	1815	1815	2233	2.18	Gamma	3390	Approximate Gamma 95% UCL	- -
LEAD	11	10	0.3	14.5	2.25	2.47	4.15	3.09	Gamma	5.19	Approximate Gamma 95% UCL	- -
MAGNESIUM	**11**	**7**	**8.9**	**300**	**40.0**	**60.7**	**87.4**	**3.17**	**Lognormal**	**82.8**	**95% Chebyshev(MVUE) UCL**	**- -**
MANGANESE	11	11	0.44	15.5	4.15	4.15	4.45	1.90	Gamma	7.64	Approximate Gamma 95% UCL	- -
MERCURY	**11**	**2**	**0.05**	**0.100**	**0.022**	**0.075**	**0.029**	**2.54**	**Non-parametric**	**0.059**	**95% Chebyshev(Mean, Std) UCL**	**- -**
POTASSIUM	**11**	**5**	**110**	**841**	**227**	**433**	**304**	**1.79**	**Non-parametric**	**1139**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max**
SELENIUM	**11**	**1**	**1.1**	**1.10**	**0.327**	**1.10**	**0.262**	**3.10**	**Non-parametric**	**0.470**	**Student-t or Modified-t UCL**	**Max ND > UCL**
SILVER	**11**	**1**	**0.57**	**0.570**	**0.292**	**0.570**	**0.094**	**3.11**	**Non-parametric**	**0.344**	**Student-t or Modified-t UCL**	**Max ND > UCL**
SODIUM	**11**	**2**	**16.3**	**25.6**	**8.66**	**21.0**	**6.42**	**2.36**	**Non-parametric**	**17.1**	**95% Chebyshev(Mean, Std) UCL**	**- -**
VANADIUM	11	11	1.2	39.9	8.63	8.63	12.1	2.23	Lognormal	18.7	95% Chebyshev(MVUE) UCL	- -
ZINC	11	11	0.63	13.1	2.24	2.24	3.65	3.16	Non-parametric	7.04	95% Chebyshev(Mean, Std) UCL	- -
CYANIDE	11	11	0.27	0.700	0.485	0.485	0.116	-0.055	Normal	0.549	Student-t	- -
TOTAL PETROLEUM HYDROCARBONS	11	9	2.4	612	166	202	234	1.12	Gamma	678	Adjusted Gamma 95% UCL	UCL > Max

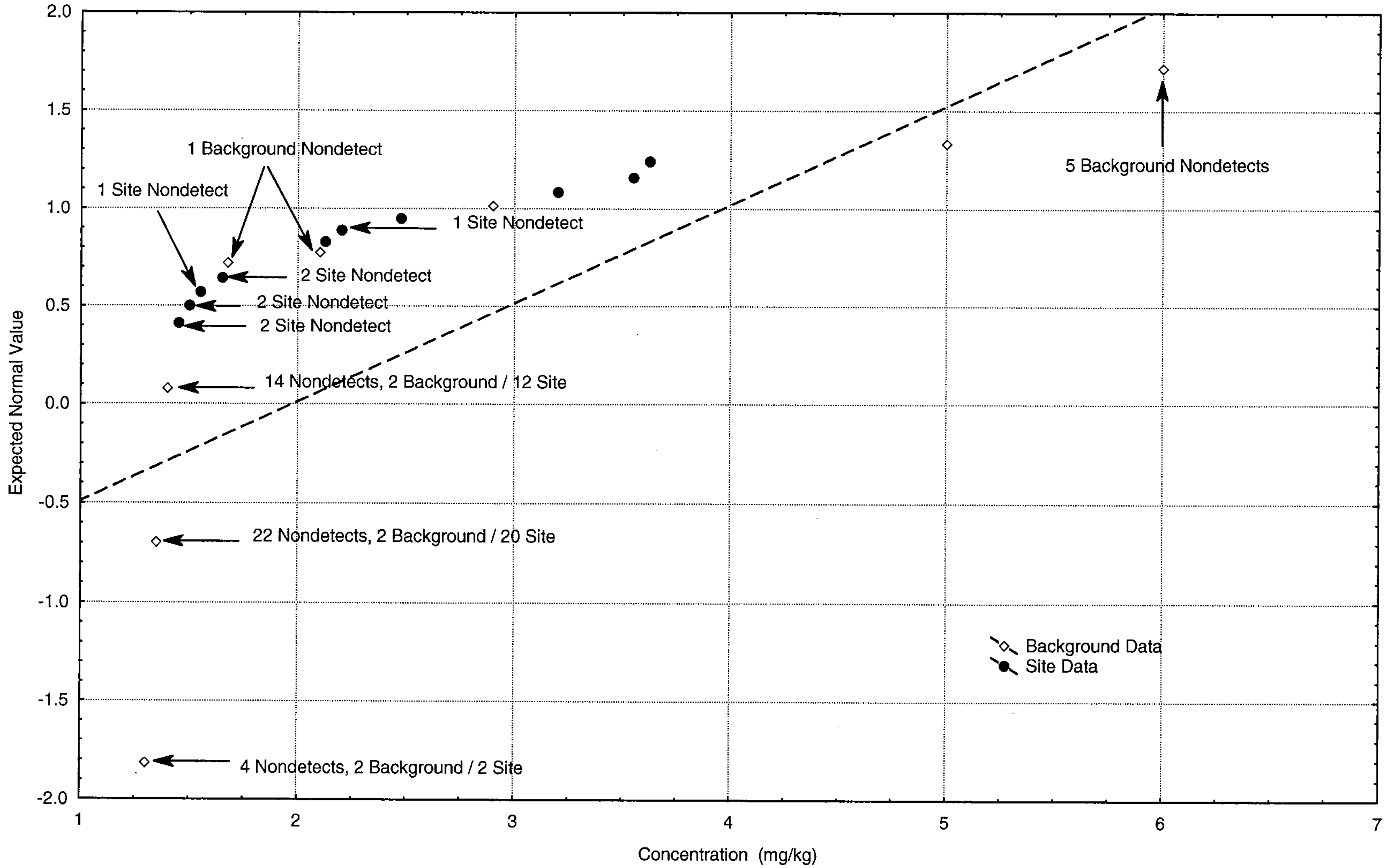
Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
N/R - Bootstrap statistics can not be calculated because there are less than five unique samples.
B qualified data were evaluated as positive detections.

Associated Samples
18SB2-15-17
18SB2-20-22
18SB4-15-17
18SB4-25-27
18SB4-35-37
18SB4-40-42
18SB6-15-17
18SB6-20-22
18SB7-15-17
18SB8-15-17
18SB9-15-17

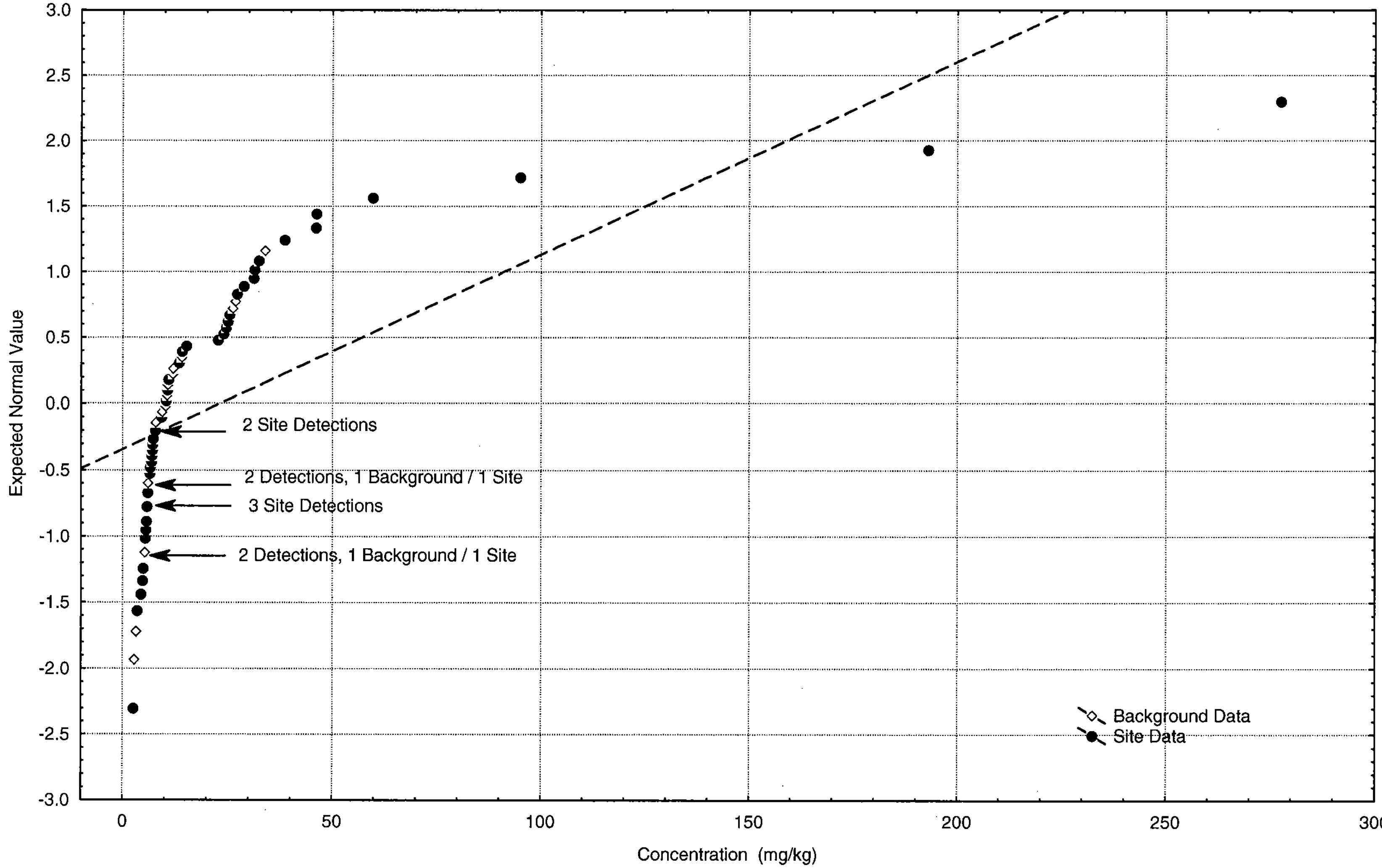
APPENDIX TABLE A-10-15
SUMMARY OF STATISTICAL COMPARISONS TO NAS WHITING FIELD BACKGROUND DATA
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Site FOD	Back FOD	Total FOD	% NDs	> 50% NDs	Site Max	Back Max	Site Mean	Back Mean	Distribution - Site	Distribution - Back	Sharpiro Wilk W Test Result	Levene's Test of Homogeniety of Variance	Test	Z or F Value	P-level	Site Above Background?	Quantile Test	Site Above Background?
SITE 18 SURFACE SOIL																			
BARIUM	47/47	15/15	62/62	0%	PASS	277.5	33.9 J	26.5	12.7	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	0.288	0.774	NO	PASS	NO
BERYLLIUM	**23/47**	8/15	31/62	50%	**FAIL**	0.11 J	0.35 J	0.0507	0.195	---	---	---	---	Proportions	---	---	NO	PASS	NO
COBALT	29/47	12/15	41/62	34%	PASS	4.15 J	2.9 J	0.846	1.48	NORMAL	LOGNORMAL	**FAIL**	---	WRS	-2.12	0.0339	NO	PASS	NO
CHROMIUM	47/47	15/15	62/62	0%	PASS	52.95 J	16.3	9.02	6.12	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	0.633	0.527	NO	PASS	NO
COPPER	44/47	12/15	56/62	10%	PASS	520.5	8.5	35.5	3.97	UNDEFINED	LOGNORMAL	**FAIL**	---	WRS	3.11	0.00189	**YES**	---	**YES**
SILVER	1/47	2/15	3/62	95%	**FAIL**	0.35 J	0.42	0.176	0.486	---	---	---	---	Proportions	---	---	NO	PASS	NO
SITE 18 SUBSURFACE SOIL																			
BARIUM	13/13	14/14	27/27	0%	PASS	7.8 J	15.8 J	4.52	7.93	NORMAL	LOGNORMAL	**FAIL**	---	WRS	-2.87	0.00413	NO	PASS	NO
BERYLLIUM	**5/13**	10/14	15/27	44%	**FAIL**	0.09 J	0.23 J	0.0477	0.101	---	---	---	---	Proportions	-1.723	0.04	NO	PASS	NO
CHROMIUM	13/13	14/14	27/27	0%	PASS	10.4	30	4.59	11.4	NORMAL	LOGNORMAL	**FAIL**	---	WRS	-2.91	0.00360	NO	PASS	NO
COBALT	7/13	8/14	15/27	44%	PASS	0.89 J	0.88 J	0.509	0.528	UNDEFINED	UNDEFINED	**FAIL**	---	WRS	-0.511	0.609	NO	PASS	NO
COPPER	11/13	14/14	25/27	7%	PASS	7	9.6	1.77	4.43	GAMMA	LOGNORMAL	**FAIL**	---	WRS	-3.28	0.00105	NO	PASS	NO
LEAD	13/13	10/14	23/27	4%	PASS	11.1	7.2	3.31	3.23	GAMMA	NORMAL	**FAIL**	---	WRS	0.0243	0.981	NO	PASS	NO
ZINC	12/13	4/14	16/27	41%	**FAIL**	4.5	8.9	1.92	3.70	---	---	---	---	Proportions	-1.396	0.08	NO	PASS	NO

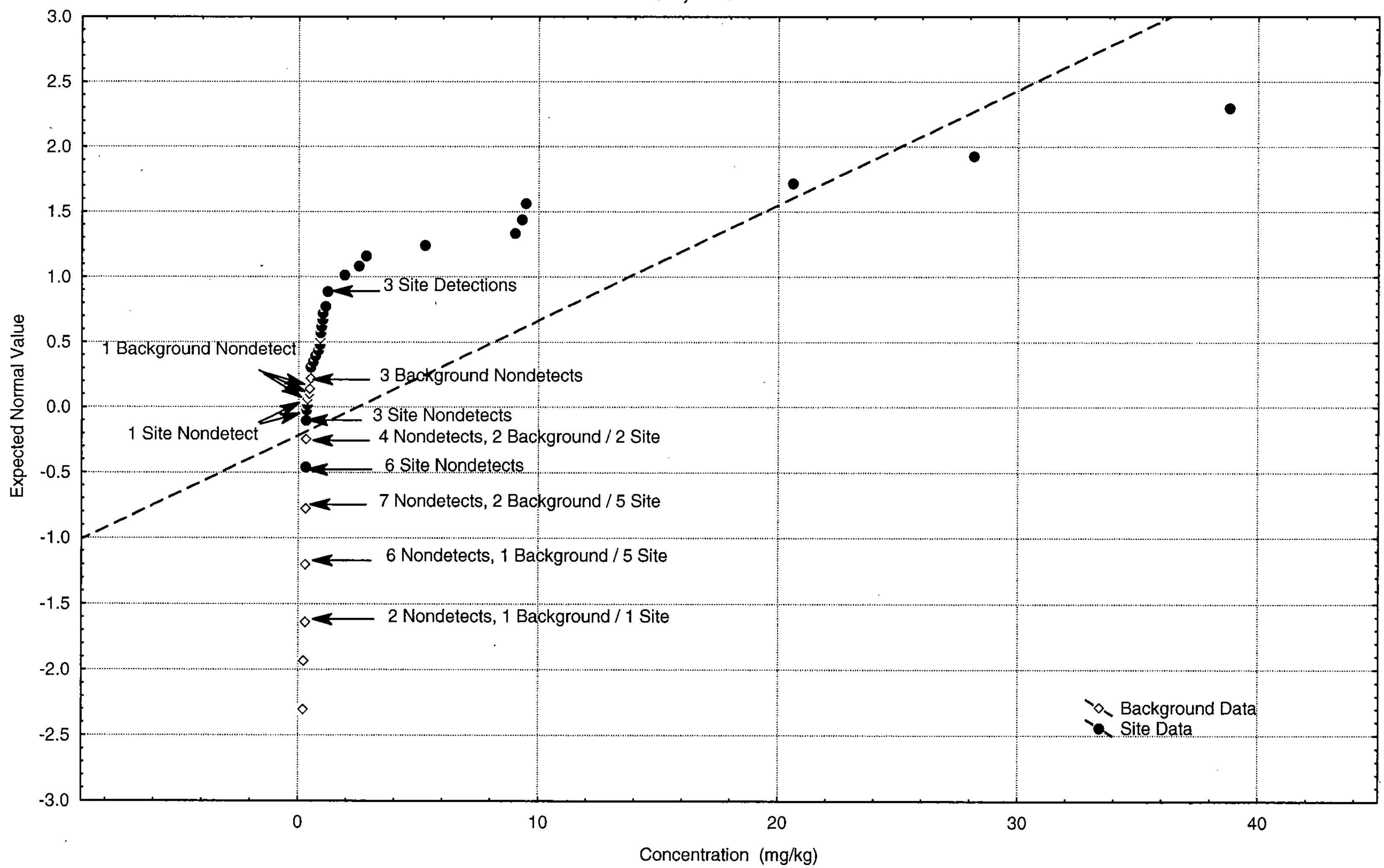
APPENDIX FIGURE A-10-1
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



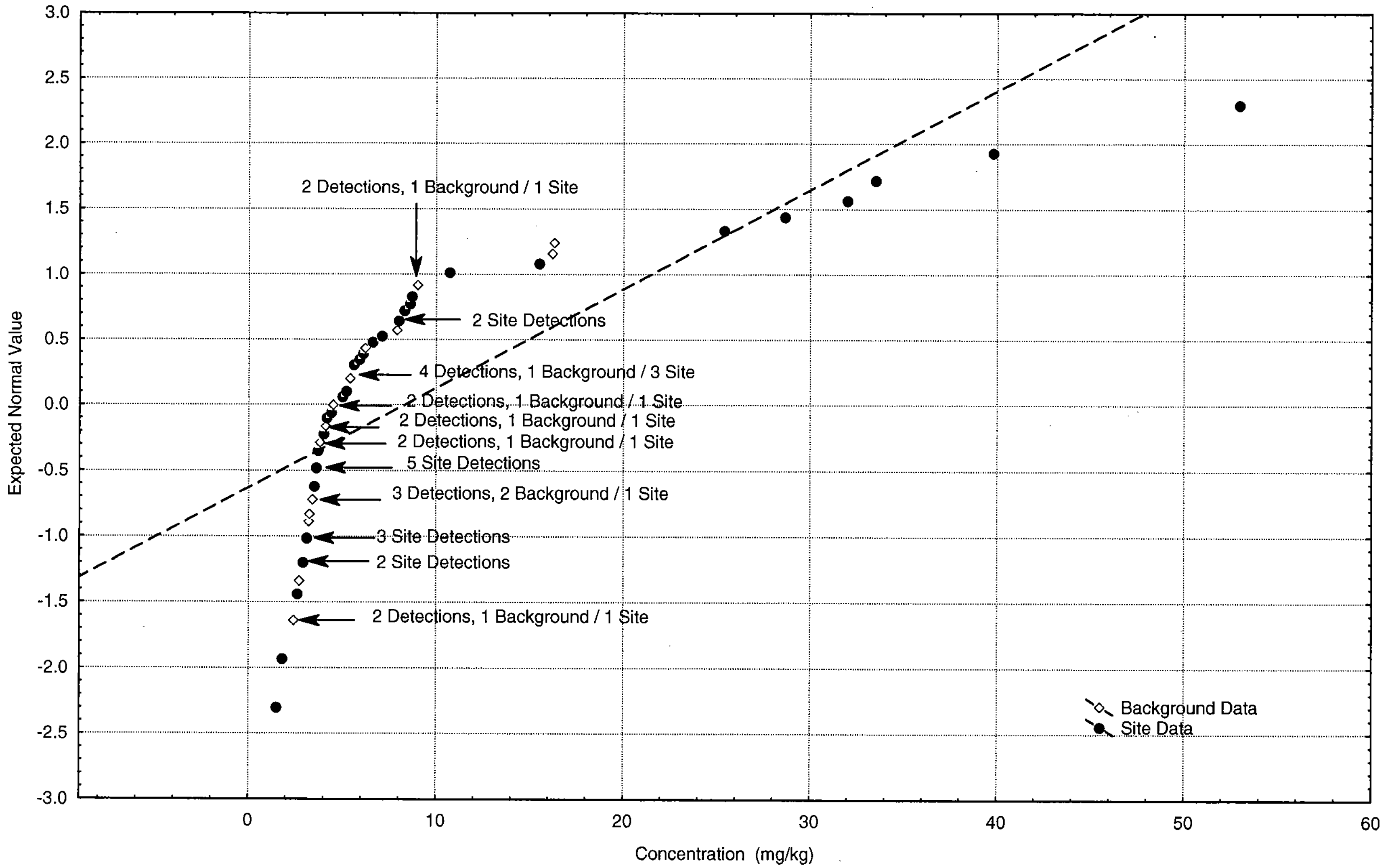
APPENDIX FIGURE A-10-2
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



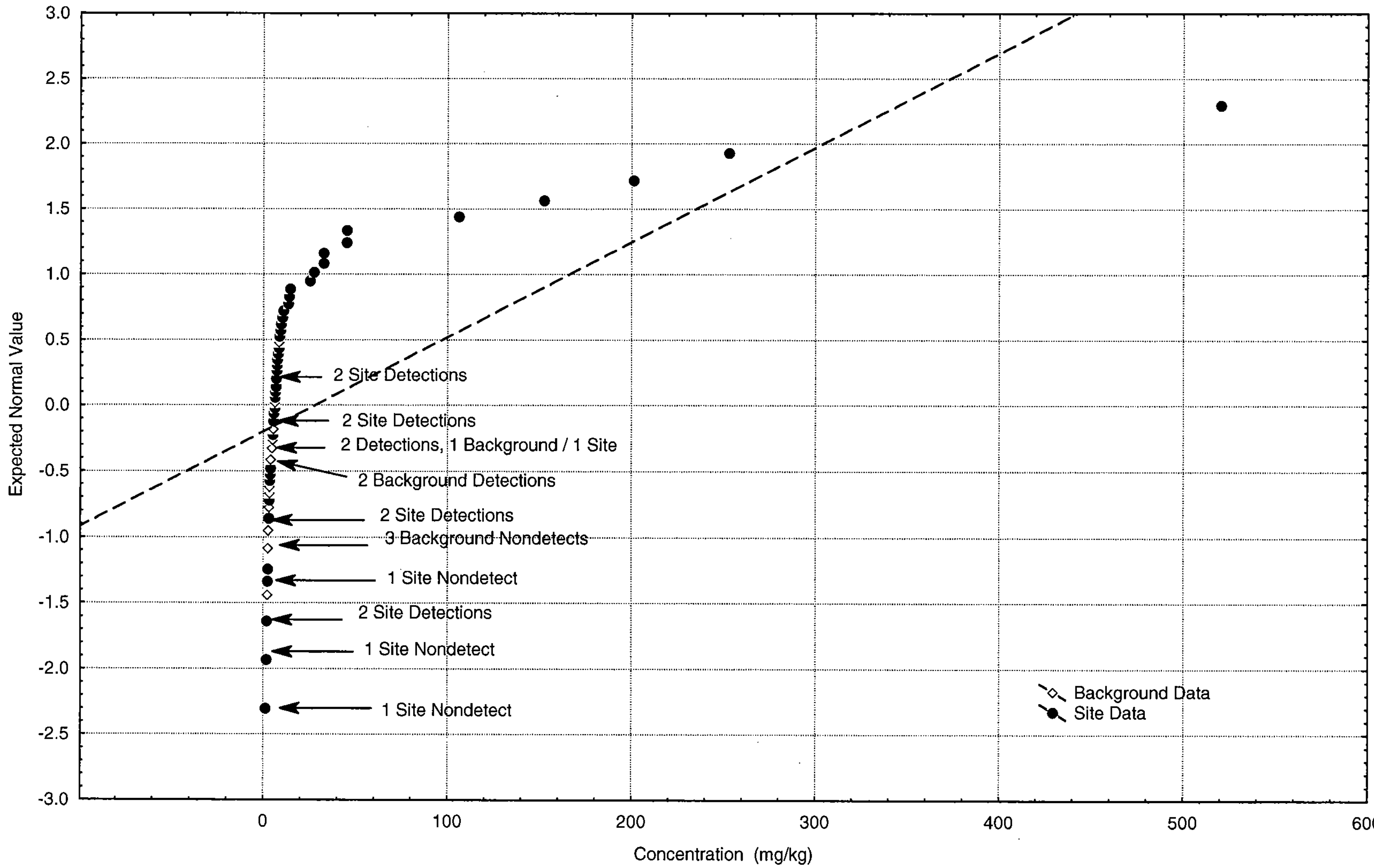
APPENDIX FIGURE A-10-3
NORMAL PROBABILITY PLOT - CADMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



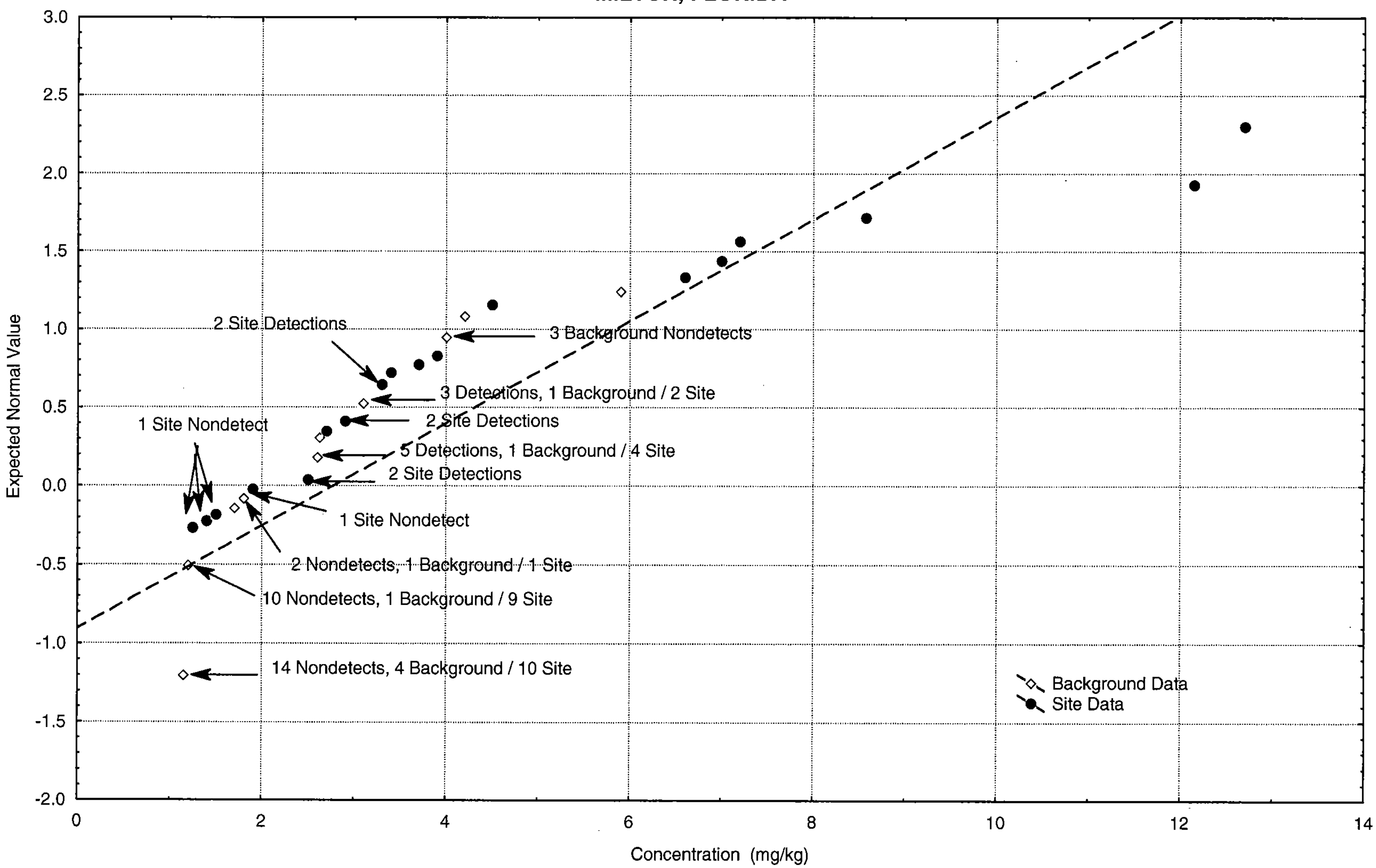
APPENDIX FIGURE A-10-4
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



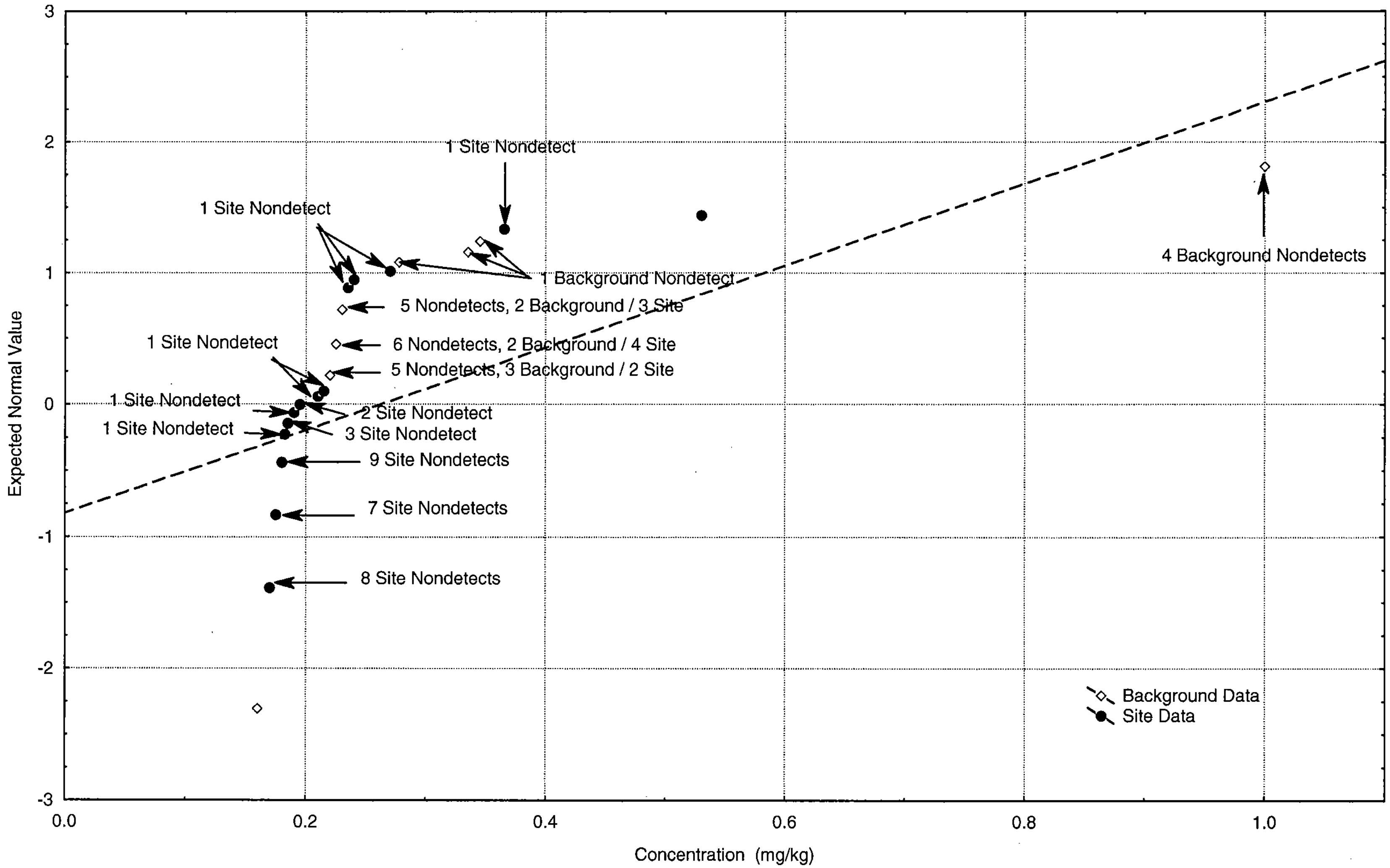
APPENDIX FIGURE A-10-5
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



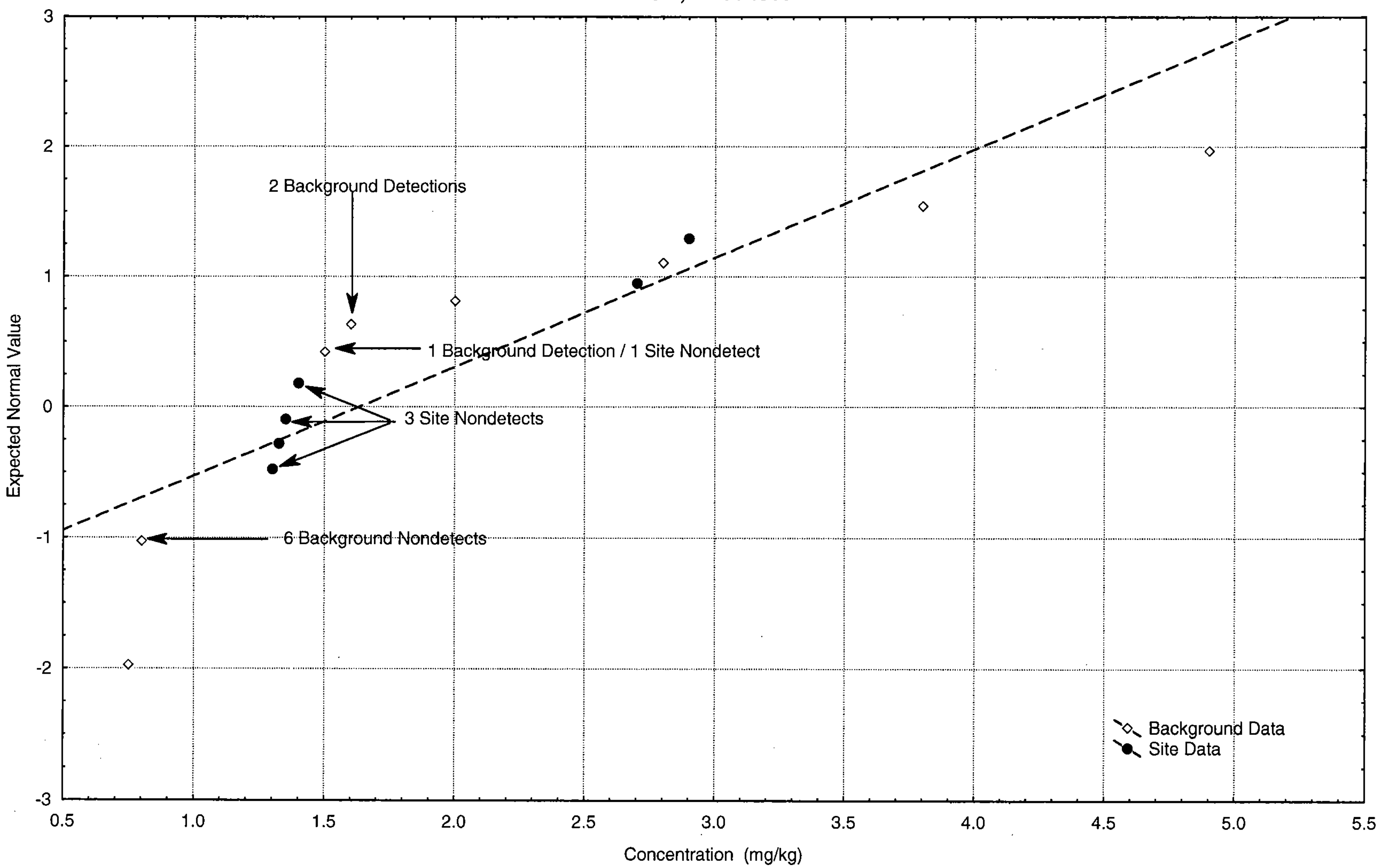
APPENDIX FIGURE A-10-6
NORMAL PROBABILITY PLOT - NICKEL - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-10-7
NORMAL PROBABILITY PLOT - THALLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-10-8
NORMAL PROBABILITY PLOT - NICKEL - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.11

SUMMARY OF ANALYTIC RESULTS – SURFACE SOIL FACILITY WIDE SURFACE SOIL BACKGROUND DATASET

APPENDIX TABLE A-11-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014									
LOCATION	BKS003	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
NSAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 0	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	11 U									
1,1,2,2-TETRACHLOROETHANE	11 U									
1,1,2-TRICHLOROETHANE	11 U									
1,1-DICHLOROETHANE	11 U									
1,1-DICHLOROETHENE	11 U									
1,2-DICHLOROETHANE	11 UJ									
1,2-DICHLOROPROPANE	11 U									
2-BUTANONE	11 UJ									
2-HEXANONE	11 U									
4-METHYL-2-PENTANONE	11 U									
ACETONE	11 UJ									
BENZENE	11 U									
BROMODICHLOROMETHANE	11 U									
BROMOFORM	11 U									
BROMOMETHANE	11 U									
CARBON DISULFIDE	11 U									
CARBON TETRACHLORIDE	11 U									
CHLOROBENZENE	11 U									
CHLORODIBROMOMETHANE	11 U									
CHLOROETHANE	11 UJ									
CHLOROFORM	11 U									
CHLOROMETHANE	11 U									
CIS-1,3-DICHLOROPROPENE	11 U									
ETHYLBENZENE	11 U									
METHYLENE CHLORIDE	11 U									
STYRENE	11 U									
TETRACHLOROETHENE	11 U									
TOLUENE	11 U									
TOTAL 1,2-DICHLOROETHENE	11 U									
TOTAL XYLENES	11 U									
TRANS-1,3-DICHLOROPROPENE	11 U									
TRICHLOROETHENE	11 U									
VINYL CHLORIDE	11 U									
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	370 U									
1,2-DICHLOROBENZENE	370 U									
1,3-DICHLOROBENZENE	370 U									
1,4-DICHLOROBENZENE	370 U									
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U									

SITE	0014									
LOCATION	BKS003	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
NSAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 0	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	930 U									
2,4,6-TRICHLOROPHENOL	370 U									
2,4-DICHLOROPHENOL	370 U									
2,4-DIMETHYLPHENOL	370 U									
2,4-DINITROPHENOL	930 U									
2,4-DINITROTOLUENE	370 U									
2,6-DINITROTOLUENE	370 U									
2-CHLORONAPHTHALENE	370 U									
2-CHLOROPHENOL	370 U									
2-METHYLNAPHTHALENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
2-METHYLPHENOL	370 U									
2-NITROANILINE	930 U									
2-NITROPHENOL	370 U									
3,3'-DICHLOROBENZIDINE	370 U									
3-NITROANILINE	930 U									
4,6-DINITRO-2-METHYLPHENOL	930 U									
4-BROMOPHENYL PHENYL ETHER	370 U									
4-CHLORO-3-METHYLPHENOL	370 U									
4-CHLOROANILINE	370 U									
4-METHYLPHENOL	370 U									
4-NITROANILINE	930 U									
4-NITROPHENOL	930 U									
ACENAPHTHENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
ACENAPHTHYLENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
ANTHRACENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BENZO(A)ANTHRACENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BENZO(A)PYRENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BENZO(B)FLUORANTHENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BENZO(G,H,I)PERYLENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BENZO(K)FLUORANTHENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
BIS(2-CHLOROETHOXY)METHANE	370 U									
BIS(2-CHLOROETHYL)ETHER	370 U									
BIS(2-ETHYLHEXYL)PHTHALATE	370 U									
BUTYL BENZYL PHTHALATE	370 U									
CARBAZOLE	370 U									
CHRYSENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
DI-N-BUTYL PHTHALATE	370 U									
DI-N-OCTYL PHTHALATE	370 U									
DIBENZO(A,H)ANTHRACENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
DIBENZOFURAN	370 U									

SITE	0014									
LOCATION	BKS003	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
NSAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 0	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIETHYL PHTHALATE	370 U									
DIMETHYL PHTHALATE	370 U									
FLUORANTHENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
FLUORENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
HEXACHLOROBENZENE	370 U									
HEXACHLOROBUTADIENE	370 U									
HEXACHLOROCYCLOPENTADIENE	370 UJ									
HEXACHLOROETHANE	370 U									
INDENO(1,2,3-CD)PYRENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
ISOPHORONE	370 U									
N-NITROSO-DI-N-PROPYLAMINE	370 UJ									
N-NITROSODIPHENYLAMINE	370 U									
NAPHTHALENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
NITROBENZENE	370 U									
PENTACHLOROPHENOL	930 U									
PHENANTHRENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
PHENOL	370 U									
PYRENE	370 U	53 U	54 U	56 U	55 U	56 U	54 U	54 U	54 U	53 U
Pesticides PCBs (ug/kg)										
4,4'-DDD	3.7 U	17 U	17 U	18 U	18 U	18 U	17 U	170 U	17 U	17 U
4,4'-DDE	3.7 U	17 U	17 U	8.7 J	18 U	16 J	17 U	170 U	17 U	17 U
4,4'-DDT	3.7 U	17 U	17 U	6 J	18 U	9.6 J	17 U	170 U	17 U	17 U
ALDRIN	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
ALPHA-BHC	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
ALPHA-CHLORDANE	1.9 U	85 U	87 U	90 U	88 U	1.4 J	87 U	860 U	86 U	85 U
AROCLOR-1016	37 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
AROCLOR-1221	75 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
AROCLOR-1232	37 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
AROCLOR-1242	37 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
AROCLOR-1248	37 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
AROCLOR-1254	37 U	170 U	170 U	180 U	180 U	180 U	170 U	1700 U	170 U	170 U
AROCLOR-1260	37 U	170 U	170 U	180 U	180 U	180 U	170 U	1700 U	170 U	170 U
BETA-BHC	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
DELTA-BHC	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
DIELDRIN	3.7 U	17 U	17 U	18 U	18 U	9 J	17 U	170 U	17 U	23 J
ENDOSULFAN I	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
ENDOSULFAN II	3.7 U	17 U	17 U	18 U	18 U	18 U	17 U	170 U	17 U	17 U
ENDOSULFAN SULFATE	3.7 UJ	17 U	17 U	18 U	18 U	18 U	17 U	170 U	17 U	17 U
ENDRIN	3.7 U	17 U	17 U	18 U	18 U	18 U	17 U	170 U	17 U	17 U
ENDRIN ALDEHYDE	3.7 U									

APPENDIX TABLE A-11-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014									
LOCATION	BKS003	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
NSAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 0	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	3.7 U	17 U	17 U	18 U	18 U	18 U	17 U	170 U	17 U	17 U
GAMMA-BHC (LINDANE)	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
GAMMA-CHLORDANE	1.9 U	85 U	87 U	90 U	88 U	5.2 J	87 U	860 U	86 U	85 U
HEPTACHLOR	1.9 U	8.5 U	8.7 U	9 U	8.8 U	9 U	8.7 U	86 U	8.6 U	8.5 U
HEPTACHLOR EPOXIDE	1.9 U	8.5 U	8.7 U	9 U	8.8 U	3.4 J	8.7 U	86 U	8.6 U	8.5 U
METHOXYCHLOR	19 U	85 U	87 U	90 U	88 U	90 U	87 U	860 U	86 U	85 U
TOXAPHENE	190 U	170 U	170 U	180 U	180 U	180 U	170 U	1700 U	170 U	170 U
Inorganics (mg/kg)										
ALUMINUM	5610 J	2510	5410	12400	11100	20800	21300	6350	7900	2510
ANTIMONY	12 UJ	2.6 U	2.9 J	2.8 U	2.7 U	2.8 U	5 J	2.7 U	4.2 U	2.6 U
ARSENIC	1.2 J	0.69 J	0.91 J	1.9 J	2 J	3.1	3.7	1.2 J	1.3 J	0.58 J
BARIUM	14 J	2.7 J	7.8 J	33.9 J	11.9 J	26.8 J	26.2 J	10.5 J	9.3 J	2.4 J
BERYLLIUM	1 U	0.05 U	0.09 J	0.23 J	0.12 J	0.3 J	0.35 J	0.11 J	0.08 U	0.05 U
CADMIUM	1 U	0.58 U	0.6 U	0.62 U	0.6 U	0.62 U	0.9 U	0.59 U	0.93 U	0.58 U
CALCIUM	232 J	290 J	269 J	439 J	327 J	3750	262 J	216 J	210 J	118 J
CHROMIUM	4.1	3.4	6.2	9	7.9	16.2	16.3	4.5	5.4	2.3
COBALT	0.98 J	0.33 U	1.2 J	2.6 J	1.2 J	2.5 J	2.9 J	0.89 J	0.97 J	0.33 U
COPPER	5 UJ	2.1 J	4.6 J	5 J	3.9 J	6.3	8.5	3.9 J	5.4 J	1.8 J
IRON	3320 J	2260	3380	7720	5900	12500	12400	3400	4430	1670
LEAD	6.2 J	1.8	2.7 J	7.6	4.1 J	8.4 J	8 J	3.3	9.8 J	5.9 J
MAGNESIUM	89.5 J	88.9 J	149 J	219 J	153 J	1570	316 J	109 J	119 J	46.9 J
MANGANESE	246	44.4	66.7	976	233	698	236	314	149	14
MERCURY	0.1 U	0.04 U	0.04 U	0.04 J	0.04 U	0.04 U	0.07 J	0.03 U	0.06 U	0.04 U
NICKEL	8 U	2.3 U	2.4 U	3.1 J	2.3 U	4.2 J	5.9 J	2.3 U	3.6 U	2.3 U
POTASSIUM	1000 U	128 U	132 U	136 U	131 U	236 J	197 U	129 U	203 U	127 U
SELENIUM	0.18 J	0.4 U	0.41 U	0.42 U	0.41 U	0.42 U	0.61 U	0.4 J	0.63 U	0.39 U
SILVER	2 U	0.32 U	0.35 J	0.34 U	0.33 U	0.42 J	0.49 U	0.32 U	0.5 U	0.31 U
SODIUM	125 J	150 J	190 J	152 J	141 J	158 J	227 J	149 J	235 J	145 J
THALLIUM	2 U	0.44 U	0.45 U	0.46 U	0.45 U	0.46 U	0.67 U	0.44 U	0.69 U	0.43 U
VANADIUM	8.5 J	6.1 J	8.7 J	20.1	15.2	31.9	31.1	8.8 J	10.5 J	3.7 J
ZINC	4 UJ	4.8	7.4	9.8 J	9.7 J	11.9 J	16.3 J	7.7 J	8.7 J	5.5 J
Miscellaneous Parameteres (mg/kg)										
CYANIDE	0.11 J	0.23 U	0.24 U	0.25 U	0.24 U	0.25 U	0.36 U	0.23 U	0.37 U	0.23 U

APPENDIX TABLE A-11-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE									0001
LOCATION	BKG-SL-09	BKG-SL-09	BKG-SL-10	BKS001	BKS002	BKS002	BKS002	BKS004	BKS005
NSAMPLE	BKG-SL-09-AVG	BKG-SL-09-D	BKG-SL-10	BKS00101	BKS00201	BKS00201-AVG	BKS00201-D	BKS00401	BKS00501
SAMPLE	BKG-SL-09-AVG	BKG-SL-09A	BKG-SL-10	BKS00101	BKS00201	BKS00201D	BKS00201D	BKS00401	BKS00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 2	0 - 2	0 - 2	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/10/1992	8/10/1992	8/10/1992	1/9/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)									
1,1,1-TRICHLOROETHANE				11 U	11 U	11 U	11 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE				11 U	11 U	11 U	11 U	12 U	11 U
1,1,2-TRICHLOROETHANE				11 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHANE				11 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHENE				11 U	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
1,2-DICHLOROETHANE				11 UJ	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROPROPANE				11 U	11 U	11 U	11 U	12 U	11 U
2-BUTANONE				11 UJ	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
2-HEXANONE				11 U	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
4-METHYL-2-PENTANONE				11 U	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
ACETONE				11 UJ	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
BENZENE				11 U	11 U	11 U	11 U	12 U	11 U
BROMODICHLOROMETHANE				11 U	11 U	11 U	11 U	12 U	11 U
BROMOFORM				11 U	11 U	11 U	11 U	12 U	11 U
BROMOMETHANE				11 U	11 U	11 U	11 U	12 U	11 U
CARBON DISULFIDE				11 U	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
CARBON TETRACHLORIDE				11 U	11 U	11 U	11 U	12 U	11 U
CHLOROBENZENE				11 U	11 U	11 U	11 U	12 U	11 U
CHLORODIBROMOMETHANE				11 U	11 U	11 U	11 U	12 U	11 U
CHLOROETHANE				11 UJ	11 U	11 U	11 U	12 U	11 U
CHLOROFORM				11 U	11 U	11 U	11 U	12 U	11 U
CHLOROMETHANE				11 U	11 U	11 U	11 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE				11 U	11 U	11 U	11 U	12 U	11 U
ETHYLBENZENE				11 U	11 U	11 U	11 U	12 U	11 U
METHYLENE CHLORIDE				11 U	11 UJ	11 UJ	11 UJ	12 UJ	11 UJ
STYRENE				11 U	11 U	11 U	11 U	12 U	11 U
TETRACHLOROETHENE				11 U	11 U	11 U	11 U	12 U	11 U
TOLUENE				11 U	11 U	11 U	11 U	12 U	11 U
TOTAL 1,2-DICHLOROETHENE				11 U	11 U	11 U	11 U	12 U	11 U
TOTAL XYLENES				11 U	11 U	11 U	11 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE				11 U	11 U	11 U	11 U	12 U	11 U
TRICHLOROETHENE				11 U	11 U	11 U	11 U	12 U	11 U
VINYL CHLORIDE				11 U	11 U	11 U	11 U	12 U	11 U
Semivolatile Organics (ug/kg)									
1,2,4-TRICHLOROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
1,2-DICHLOROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
1,3-DICHLOROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
1,4-DICHLOROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)				360 U	370 U	365 U	360 U	400 U	370 U

APPENDIX TABLE A-11-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE									0001
LOCATION	BKG-SL-09	BKG-SL-09	BKG-SL-10	BKS001	BKS002	BKS002	BKS002	BKS004	BKS005
NSAMPLE	BKG-SL-09-AVG	BKG-SL-09-D	BKG-SL-10	BKS00101	BKS00201	BKS00201-AVG	BKS00201-D	BKS00401	BKS00501
SAMPLE	BKG-SL-09-AVG	BKG-SL-09A	BKG-SL-10	BKS00101	BKS00201	BKS00201D	BKS00201D	BKS00401	BKS00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 2	0 - 2	0 - 2	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/10/1992	8/10/1992	8/10/1992	1/9/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL				900 U	920 U	915 U	910 U	1000 U	920 U
2,4,6-TRICHLOROPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
2,4-DICHLOROPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
2,4-DIMETHYLPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
2,4-DINITROPHENOL				900 U	920 U	915 U	910 U	1000 U	920 U
2,4-DINITROTOLUENE				360 U	370 U	365 U	360 U	400 U	370 U
2,6-DINITROTOLUENE				360 U	370 U	365 U	360 U	400 U	370 U
2-CHLORONAPHTHALENE				360 U	370 U	365 U	360 U	400 U	370 U
2-CHLOROPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
2-METHYLNAPHTHALENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
2-METHYLPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
2-NITROANILINE				900 U	920 U	915 U	910 U	1000 U	920 U
2-NITROPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
3,3'-DICHLOROBENZIDINE				360 U	370 U	365 U	360 U	400 U	370 U
3-NITROANILINE				900 U	920 U	915 U	910 U	1000 U	920 U
4,6-DINITRO-2-METHYLPHENOL				900 U	920 U	915 U	910 U	1000 U	920 U
4-BROMOPHENYL PHENYL ETHER				360 U	370 U	365 U	360 U	400 U	370 U
4-CHLORO-3-METHYLPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
4-CHLOROANILINE				360 U	370 U	365 U	360 U	400 U	370 U
4-METHYLPHENOL				360 U	370 U	365 U	360 U	400 U	370 U
4-NITROANILINE				900 U	920 U	915 U	910 U	1000 U	920 U
4-NITROPHENOL				900 U	920 UJ	915 UJ	910 UJ	1000 UJ	920 UJ
ACENAPHTHENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
ACENAPHTHYLENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
ANTHRACENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
BENZO(A)ANTHRACENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
BENZO(A)PYRENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
BENZO(B)FLUORANTHENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
BENZO(G,H,I)PERYLENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
BENZO(K)FLUORANTHENE	53 U	53 U	53 U	360 UJ	370 U	365 U	360 U	400 U	370 U
BIS(2-CHLOROETHOXY)METHANE				360 U	370 U	365 U	360 U	400 U	370 U
BIS(2-CHLOROETHYL)ETHER				360 U	370 U	365 U	360 U	400 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE				360 U	370 U	45 J	45 J	69 J	57 J
BUTYL BENZYL PHTHALATE				360 U	370 U	365 U	360 U	400 U	370 U
CARBAZOLE				360 U	370 U	365 U	360 U	400 U	370 U
CHRYSENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
DI-N-BUTYL PHTHALATE				360 U	370 U	365 U	360 U	400 U	370 U
DI-N-OCTYL PHTHALATE				360 U	370 U	365 U	360 U	400 U	370 U
DIBENZO(A,H)ANTHRACENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
DIBENZOFURAN				360 U	370 U	365 U	360 U	400 U	370 U

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FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE									0001
LOCATION	BKG-SL-09	BKG-SL-09	BKG-SL-10	BKS001	BKS002	BKS002	BKS002	BKS004	BKS005
NSAMPLE	BKG-SL-09-AVG	BKG-SL-09-D	BKG-SL-10	BKS00101	BKS00201	BKS00201-AVG	BKS00201-D	BKS00401	BKS00501
SAMPLE	BKG-SL-09-AVG	BKG-SL-09A	BKG-SL-10	BKS00101	BKS00201	BKS00201D	BKS00201D	BKS00401	BKS00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 2	0 - 2	0 - 2	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/10/1992	8/10/1992	8/10/1992	1/9/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIETHYL PHTHALATE				360 U	370 U	365 U	360 U	400 U	370 U
DIMETHYL PHTHALATE				360 U	370 U	365 U	360 U	400 U	370 U
FLUORANTHENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
FLUORENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
HEXACHLOROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
HEXACHLOROBUTADIENE				360 U	370 U	365 U	360 U	400 U	370 U
HEXACHLOROCYCLOPENTADIENE				360 U	370 U	365 U	360 U	400 U	370 U
HEXACHLOROETHANE				360 U	370 U	365 U	360 U	400 U	370 U
INDENO(1,2,3-CD)PYRENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
ISOPHORONE				360 U	370 U	365 U	360 U	400 U	370 U
N-NITROSO-DI-N-PROPYLAMINE				360 U	370 U	365 U	360 U	400 U	370 U
N-NITROSODIPHENYLAMINE				360 U	370 U	365 U	360 U	400 U	370 U
NAPHTHALENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
NITROBENZENE				360 U	370 U	365 U	360 U	400 U	370 U
PENTACHLOROPHENOL				900 U	920 U	915 U	910 U	1000 U	920 U
PHENANTHRENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
PHENOL				360 U	370 U	365 U	360 U	400 U	370 U
PYRENE	53 U	53 U	53 U	360 U	370 U	365 U	360 U	400 U	370 U
Pesticides PCBs (ug/kg)									
4,4'-DDD	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
4,4'-DDE	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
4,4'-DDT	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
ALDRIN	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
ALPHA-BHC	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
ALPHA-CHLORDANE	85 U	85 U	85 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
AROCLOR-1016	85 U	85 U	85 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
AROCLOR-1221	85 U	85 U	85 U	73 UJ	74 U	74 U	74 U	82 U	74 U
AROCLOR-1232	85 U	85 U	85 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
AROCLOR-1242	85 U	85 U	85 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
AROCLOR-1248	85 U	85 U	85 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
AROCLOR-1254	170 U	170 U	170 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
AROCLOR-1260	170 U	170 U	170 U	36 UJ	37 U	36.5 U	36 U	40 U	37 U
BETA-BHC	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
DELTA-BHC	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
DIELDRIN	29 J	35	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
ENDOSULFAN I	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
ENDOSULFAN II	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
ENDOSULFAN SULFATE	17 U	17 U	17 U	3.6 UJ	3.7 UJ	3.65 UJ	3.6 UJ	4 UJ	3.7 UJ
ENDRIN	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
ENDRIN ALDEHYDE				3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U

APPENDIX TABLE A-11-1
SUMMARY OF ANALYTIC RESULTS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE									0001
LOCATION	BKG-SL-09	BKG-SL-09	BKG-SL-10	BKS001	BKS002	BKS002	BKS002	BKS004	BKS005
NSAMPLE	BKG-SL-09-AVG	BKG-SL-09-D	BKG-SL-10	BKS00101	BKS00201	BKS00201-AVG	BKS00201-D	BKS00401	BKS00501
SAMPLE	BKG-SL-09-AVG	BKG-SL-09A	BKG-SL-10	BKS00101	BKS00201	BKS00201D	BKS00201D	BKS00401	BKS00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 2	0 - 2	0 - 2	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/10/1992	8/10/1992	8/10/1992	1/9/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN KETONE	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
GAMMA-BHC (LINDANE)	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
GAMMA-CHLORDANE	85 U	85 U	85 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
HEPTACHLOR	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
HEPTACHLOR EPOXIDE	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
METHOXYCHLOR	85 U	85 U	85 U	18 UJ	19 U	19 U	19 U	21 U	19 U
TOXAPHENE	170 U	170 U	170 U	180 UJ	190 U	190 U	190 U	210 U	190 U
Inorganics (mg/kg)									
ALUMINUM	3300	4090	5040	5590 J	6640 J	5435 J	4230 J	5080 J	6330 J
ANTIMONY	3.35 U	4.1 U	2.6 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	0.655 J	0.73 J	1 J	1.6 J	1.6 J	1.295 J	0.99 J	1.2 J	1.3 J
BARIUM	3.15 J	3.9 J	5.2 J	6 J	11.4 J	10.15 J	8.9 J	10.7 J	12 J
BERYLLIUM	0.065 U	0.08 U	0.05 U	1 U	0.05 J	0.05 J	1 U	1 U	0.05 J
CADMIUM	0.745 U	0.91 U	0.9 J	1 U	0.21 J	0.21 J	1 U	1 U	0.22 J
CALCIUM	179 J	240 J	401 J	82 J	132 J	173.5 J	215 J	202 J	166 J
CHROMIUM	3.25	4.2	3.8	3.4	3.4	2.7 J	2 J	2.4 J	3.2
COBALT	0.425 U	0.52 U	0.75 J	0.78 J	1 J	1 J	10 U	10 U	1 J
COPPER	3.05 J	4.3 J	3.3 J	5 UJ	3.4 J	3.4 J	5 UJ	2.6 J	5 UJ
IRON	2225	2780	2780	3180 J	3340	2780	2220	2630	3130
LEAD	4.85 J	3.8 J	4.1 J	3.9 J	5.9	5.5	5.1	6.5	5.6
MAGNESIUM	62.85 J	78.8 J	122 J	68.8 J	124 J	98.25 J	72.5 J	88 J	120 J
MANGANESE	20.8	27.6	144	86.4	249	233	217	238	246
MERCURY	0.045 U	0.05 U	0.04 U	0.1 U	0.04 J	0.045 J	0.05 J	0.07 J	0.04 J
NICKEL	2.625 J	4.1 J	2.3 U	8 U	2.6 J	2.6 J	8 U	8 U	1.7 J
POTASSIUM	163.5 U	200 U	128 U	1000 U	96.8 J	81.3 J	65.8 J	96.8 J	87.4 J
SELENIUM	0.505 U	0.62 U	0.39 U	0.2 J	0.16 J	0.15 J	0.14 J	0.19 J	0.22 J
SILVER	0.405 U	0.5 U	0.32 U	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	181 J	217 J	144 J	143 J	184 J	265 J	346 J	216 J	196 J
THALLIUM	0.555 U	0.68 U	0.44 U	2 U	0.16 J	0.16 J	2 U	2 U	2 U
VANADIUM	4.95 J	6.2 J	6.7 J	7.5 J	8.1 J	6.55 J	5 J	6 J	7.7 J
ZINC	8.65 J	11.8 J	12.1 J	4 UJ	5.6	4.4 J	3.2 J	4.3 J	5.1
Miscellaneous Parameteres (mg/kg)									
CYANIDE	0.3 U	0.37 U	0.23 U	0.14 J	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ	0.5 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE										
LOCATION	BKB001	BKB001	BKB002	BKB002	BKB003	BKB003	BKB004	BKB004	BKB004	BKB004
NSAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401-AVG	BKB00401-D	BKB00402
SAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401	BKB00401-D	BKB00402
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/20/1996	5/20/1996	5/20/1996	5/20/1996	5/21/1996	5/21/1996	5/20/1996	5/20/1996	5/20/1996	5/20/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)										
1,1,1-TRICHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,1,2,2-TETRACHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,1,2-TRICHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,1-DICHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,1-DICHLOROETHENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,2-DICHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
1,2-DICHLOROPROPANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
2-BUTANONE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
2-HEXANONE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
4-METHYL-2-PENTANONE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
ACETONE	43 U	41 U	18 U	11 U	11 U	11 U	10 U	13.5 U	17 U	14 U
BENZENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
BROMODICHLOROMETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
BROMOFORM	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
BROMOMETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CARBON DISULFIDE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CARBON TETRACHLORIDE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CHLOROBENZENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CHLORODIBROMOMETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CHLOROETHANE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CHLOROFORM	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
CHLOROMETHANE	10 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	10 UJ	10 UJ	10 U	11 UJ
CIS-1,3-DICHLOROPROPENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
ETHYLBENZENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
METHYLENE CHLORIDE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
STYRENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TETRACHLOROETHENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TOLUENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TOTAL 1,2-DICHLOROETHENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TOTAL XYLENES	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TRANS-1,3-DICHLOROPROPENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
TRICHLOROETHENE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
VINYL CHLORIDE	10 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	10 U	11 U
Semivolatile Organics (ug/kg)										
1,2,4-TRICHLOROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
1,2-DICHLOROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
1,3-DICHLOROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
1,4-DICHLOROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE										
LOCATION	BKB001	BKB001	BKB002	BKB002	BKB003	BKB003	BKB004	BKB004	BKB004	BKB004
NSAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401-AVG	BKB00401-D	BKB00402
SAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401	BKB00401-D	BKB00402
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/20/1996	5/20/1996	5/20/1996	5/20/1996	5/21/1996	5/21/1996	5/20/1996	5/20/1996	5/20/1996	5/20/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
2,4,6-TRICHLOROPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2,4-DICHLOROPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2,4-DIMETHYLPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2,4-DINITROPHENOL	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
2,4-DINITROTOLUENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2,6-DINITROTOLUENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2-CHLORONAPHTHALENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2-CHLOROPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2-METHYLNAPHTHALENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2-METHYLPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
2-NITROANILINE	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
2-NITROPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
3,3'-DICHLOROBENZIDINE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
3-NITROANILINE	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
4,6-DINITRO-2-METHYLPHENOL	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
4-BROMOPHENYL PHENYL ETHER	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U		370 U
4-CHLORO-3-METHYLPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
4-CHLOROANILINE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
4-CHLOROPHENYL PHENYL ETHER	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
4-METHYLPHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
4-NITROANILINE	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
4-NITROPHENOL	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
ACENAPHTHENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
ACENAPHTHYLENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
ANTHRACENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BENZO(A)ANTHRACENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BENZO(A)PYRENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BENZO(B)FLUORANTHENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BENZO(G,H,I)PERYLENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BENZO(K)FLUORANTHENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BIS(2-CHLOROETHOXY)METHANE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BIS(2-CHLOROETHYL)ETHER	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
BUTYL BENZYL PHTHALATE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
CARBAZOLE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
CHRYSENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
DI-N-BUTYL PHTHALATE	570 U	960 U	840 U	450 U	350 U	360 U	1000 U	985 U	970 U	1400 U
DI-N-OCTYL PHTHALATE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
DIBENZO(A,H)ANTHRACENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE										
LOCATION	BKB001	BKB001	BKB002	BKB002	BKB003	BKB003	BKB004	BKB004	BKB004	BKB004
NSAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401-AVG	BKB00401-D	BKB00402
SAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401	BKB00401-D	BKB00402
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/20/1996	5/20/1996	5/20/1996	5/20/1996	5/21/1996	5/21/1996	5/20/1996	5/20/1996	5/20/1996	5/20/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
DIETHYL PHTHALATE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
DIMETHYL PHTHALATE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
FLUORANTHENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
FLUORENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
HEXACHLOROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
HEXACHLOROBUTADIENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
HEXACHLOROCYCLOPENTADIENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
HEXACHLOROETHANE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
INDENO(1,2,3-CD)PYRENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
ISOPHORONE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
N-NITROSODIPHENYLAMINE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
NAPHTHALENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
NITROBENZENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
PENTACHLOROPHENOL	860 U	900 U	910 U	920 U	880 U	900 U	860 U	860 U	860 U	920 U
PHENANTHRENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
PHENOL	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
PYRENE	340 U	360 U	360 U	370 U	350 U	360 U	340 U	340 U	340 U	370 U
Pesticides PCBs (ug/kg)										
4,4'-DDD	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
4,4'-DDE	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
4,4'-DDT	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
ALDRIN	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
ALPHA-BHC	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
ALPHA-CHLORDANE	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
AROCLOR-1016	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
AROCLOR-1221	70 U	73 U	74 U	74 U	71 U	73 U	70 U	70 U	70 U	74 U
AROCLOR-1232	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
AROCLOR-1242	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
AROCLOR-1248	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
AROCLOR-1254	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
AROCLOR-1260	34 U	36 U	36 U	37 U	35 U	36 U	34 U	34 U	34 U	37 U
BETA-BHC	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
DELTA-BHC	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
DIELDRIN	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
ENDOSULFAN I	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
ENDOSULFAN II	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
ENDOSULFAN SULFATE	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
ENDRIN	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE										
LOCATION	BKB001	BKB001	BKB002	BKB002	BKB003	BKB003	BKB004	BKB004	BKB004	BKB004
NSAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401-AVG	BKB00401-D	BKB00402
SAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401	BKB00401-D	BKB00402
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/20/1996	5/20/1996	5/20/1996	5/20/1996	5/21/1996	5/21/1996	5/20/1996	5/20/1996	5/20/1996	5/20/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN ALDEHYDE	3.4 UJ	3.6 UJ	3.6 UJ	3.7 UJ	3.5 UJ	3.6 UJ	3.4 UJ	3.4 UJ	3.4 UJ	3.7 UJ
ENDRIN KETONE	3.4 U	3.6 U	3.6 U	3.7 U	3.5 U	3.6 U	3.4 U	3.4 U	3.4 U	3.7 U
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
GAMMA-CHLORDANE	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
HEPTACHLOR	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 U
METHOXYCHLOR	18 U	18 U	19 U	19 U	18 U	18 U	18 U	18 U	18 U	19 U
TOXAPHENE	180 U	180 U	190 U	190 U	180 U	180 U	180 U	180 U	180 U	190 U
Inorganics (mg/kg)										
ALUMINUM	3890	18400	16600	19800	14800	11300	3600	2945	2290	7910
ANTIMONY	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U
ARSENIC	0.52 J	5.8	4.4	2.3	1.7 J	5.6	0.54 J	0.665 J	0.79 J	1 J
BARIUM	5.7 J	3.8 J	11.5 J	7.3 J	10.2 J	3.8 J	7.2 J	6.8 J	6.4 J	7.7 J
BERYLLIUM	0.06 U	0.07 U	0.14 J	0.13 J	0.14 J	0.1 J	0.06 U	0.05 J	0.07 J	0.07 U
CADMIUM	0.25 U	0.6 J	0.35 J	0.39 J	0.34 J	0.36 J	0.25 U	0.25 U	0.25 U	0.27 U
CALCIUM	219 J	219 J	282 J	223 J	198 J	194 J	194 J	198.5 J	203 J	216 J
CHROMIUM	4.1	21.2	11.4	12.8	10.6	10.9	3.2	2.8	2.4	5.7
COBALT	0.49 J	0.5 U	0.73 J	0.82 J	0.71 J	0.5 U	0.77 J	0.675 J	0.58 J	0.51 U
COPPER	2.7 J	5.6	4.5 J	5.7	5 J	2.9 J	1.8 J	1.75 J	1.7 J	5 J
IRON	2180	15200	8940	9870	8170	9870	2220	1940	1660	4170
LEAD	1.1 U	3.8	4.9	3.8	3	4.2	1.4 U	1.55	2.4	2 U
MAGNESIUM	147 J	80.3 J	145 J	145 J	197 J	70.7 J	114 J	103.5 J	93 J	142 J
MANGANESE	16.1	20.2	26.9	19.6	27.6	15.2	19.5	17	14.5	12.1
MERCURY	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
NICKEL	1.5 U	1.6 U	2 J	1.6 U	2.8 J	1.6 U	1.5 J	1.5 J	1.5 U	1.6 U
POTASSIUM	82 J	68.6 UJ	69.7 UJ	70.1 UJ	98.8 J	68.4 UJ	84.5 J	58.7 J	65.8 UJ	70 UJ
SELENIUM	0.12 U	0.15 J	0.13 U	0.13 U	0.13 U	0.13 U	0.12 U	0.12 U	0.12 U	0.13 U
SILVER	0.52 U	0.56 J	0.55 U	0.55 U	0.53 U	0.54 U	0.52 U	0.52 U	0.52 U	0.55 U
SODIUM	29.3 U	24.7 U	30.5 U	28.9 U	25.6 U	21.2 U	27.6 U	25.05 U	22.5 U	30.1 U
THALLIUM	0.12 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.12 U	0.12 U	0.12 U	0.13 U
VANADIUM	5.2 J	38.2	21.8	26.3	19.8	24.3	4.9 J	4.15 J	3.4 J	11 J
ZINC	6.4 U	3.8 U	5.1 U	5.3 U	6.8	2.4 U	3.9 U	3.3 U	2.7 U	8.4
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.08 U	0.08 U	0.24 U	0.14 U	0.13 U	0.1 U	0.1 U	0.115 U	0.13 U	0.08 U
TOTAL ORGANIC CARBON		815		2240		531				379

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014					0032	0032
LOCATION	BKB005	BKB005	BKB006	BKB006	BKB006	BKB006	BKB007	BKB007
NSAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602-AVG	BKB00602-D	BKB00701	BKB00702
SAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602	BKB00602-D	BKB00701	BKB00702
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
2-BUTANONE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
2-HEXANONE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
ACETONE	30 U	29 U	25 U	47 U	29 U	11 U	11 U	11 U
BENZENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOFORM	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
BROMOMETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLORODIBROMOMETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROETHANE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROMETHANE	11 UJ	12 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
ETHYLBENZENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
METHYLENE CHLORIDE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
STYRENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TETRACHLOROETHENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TOLUENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL 1,2-DICHLOROETHENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TOTAL XYLENES	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
TRICHLOROETHENE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
VINYL CHLORIDE	11 U	12 U	11 U	11 U	11 U	11 U	11 U	11 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
1,2-DICHLOROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
1,3-DICHLOROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
1,4-DICHLOROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014					0032	0032
LOCATION	BKB005	BKB005	BKB006	BKB006	BKB006	BKB006	BKB007	BKB007
NSAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602-AVG	BKB00602-D	BKB00701	BKB00702
SAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602	BKB00602-D	BKB00701	BKB00702
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
2,4,5-TRICHLOROPHENOL	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
2,4,6-TRICHLOROPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2,4-DICHLOROPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2,4-DIMETHYLPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2,4-DINITROPHENOL	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
2,4-DINITROTOLUENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2,6-DINITROTOLUENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2-CHLORONAPHTHALENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2-CHLOROPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2-METHYLNAPHTHALENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2-METHYLPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
2-NITROANILINE	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
2-NITROPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
3,3'-DICHLOROBENZIDINE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
3-NITROANILINE	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
4,6-DINITRO-2-METHYLPHENOL	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
4-BROMOPHENYL PHENYL ETHER	370 U	380 U	350 U	350 U	350 U		360 U	360 U
4-CHLORO-3-METHYLPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
4-CHLOROANILINE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
4-CHLOROPHENYL PHENYL ETHER	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
4-METHYLPHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
4-NITROANILINE	920 U	970 U	890 U	890 U	890 UJ	890 UJ	900 UJ	900 UJ
4-NITROPHENOL	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
ACENAPHTHENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
ACENAPHTHYLENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
ANTHRACENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BENZO(A)ANTHRACENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BENZO(A)PYRENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BENZO(B)FLUORANTHENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BENZO(G,H,I)PERYLENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BENZO(K)FLUORANTHENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BIS(2-CHLOROETHOXY)METHANE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BIS(2-CHLOROETHYL)ETHER	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
BUTYL BENZYL PHTHALATE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
CARBAZOLE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
CHRYSENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
DI-N-BUTYL PHTHALATE	370 U	380 U	350 U	580 U	465 U	350 U	360 U	360 U
DI-N-OCTYL PHTHALATE	370 U	380 U	350 U	350 U	350 UJ	350 UJ	360 UJ	360 UJ
DIBENZO(A,H)ANTHRACENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014					0032	0032
LOCATION	BKB005	BKB005	BKB006	BKB006	BKB006	BKB006	BKB007	BKB007
NSAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602-AVG	BKB00602-D	BKB00701	BKB00702
SAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602	BKB00602-D	BKB00701	BKB00702
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
DIBENZOFURAN	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
DIETHYL PHTHALATE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
DIMETHYL PHTHALATE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
FLUORANTHENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
FLUORENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
HEXACHLOROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
HEXACHLOROBUTADIENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
HEXACHLOROCYCLOPENTADIENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
HEXACHLOROETHANE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
INDENO(1,2,3-CD)PYRENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
ISOPHORONE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
N-NITROSODIPHENYLAMINE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
NAPHTHALENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
NITROBENZENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
PENTACHLOROPHENOL	920 U	970 U	890 U	890 U	890 U	890 U	900 U	900 U
PHENANTHRENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
PHENOL	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
PYRENE	370 U	380 U	350 U	350 U	350 U	350 U	360 U	360 U
Pesticides PCBs (ug/kg)								
4,4'-DDD	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
4,4'-DDE	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
4,4'-DDT	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
ALDRIN	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ALPHA-BHC	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ALPHA-CHLORDANE	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
AROCLOR-1016	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
AROCLOR-1221	74 U	78 U	72 U	72 U	72 U	72 U	73 U	73 U
AROCLOR-1232	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
AROCLOR-1242	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
AROCLOR-1248	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
AROCLOR-1254	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
AROCLOR-1260	37 U	38 U	35 U	35 U	35 U	35 U	36 U	36 U
BETA-BHC	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
DELTA-BHC	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
DIELDRIN	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
ENDOSULFAN I	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ENDOSULFAN II	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
ENDOSULFAN SULFATE	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
ENDRIN	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U

APPENDIX TABLE A-11-2
SUMMARY OF ANALYTIC RESULTS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014					0032	0032
LOCATION	BKB005	BKB005	BKB006	BKB006	BKB006	BKB006	BKB007	BKB007
NSAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602-AVG	BKB00602-D	BKB00701	BKB00702
SAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602	BKB00602-D	BKB00701	BKB00702
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
ENDRIN ALDEHYDE	3.7 UJ	3.8 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.5 UJ	3.6 UJ	3.6 UJ
ENDRIN KETONE	3.7 U	3.8 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.6 U
GAMMA-BHC (LINDANE)	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
GAMMA-CHLORDANE	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
HEPTACHLOR	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
HEPTACHLOR EPOXIDE	1.9 U	2 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
METHOXYCHLOR	19 U	20 U	18 U	18 U	18 U	18 U	18 U	18 U
TOXAPHENE	190 U	200 U	180 U	180 U	180 U	180 U	180 U	180 U
Inorganics (mg/kg)								
ALUMINUM	14500	37300	7450	5040	5545	6050	13100	21300
ANTIMONY	1.9 U	2.2 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ARSENIC	2.7	6.3	1.1 J	1.4 J	1.175 J	0.95 J	5.4	5.3
BARIUM	9.8 J	10.2 J	7.5 J	5.2 J	5.55 J	5.9 J	5.4 J	15.8 J
BERYLLIUM	0.13 J	0.14 J	0.13 J	0.06 U	0.06 U	0.06 U	0.09 J	0.23 J
CADMIUM	0.41 J	0.71 J	0.26 U	0.26 U	0.26 U	0.26 U	0.48 J	0.52 J
CALCIUM	220 J	222 J	223 J	210 J	202.5 J	195 J	227 J	260 J
CHROMIUM	13.1	30	5	4.5	4.6	4.7	11	15.8
COBALT	0.88 J	0.87 J	0.49 U	0.5 U	0.5 U	0.5 U	0.5 U	0.72 J
COPPER	3.8 J	9.6	2.8 J	2 J	2.15 J	2.3 J	3.7 J	6.8
IRON	10200	22500	5000	3430	3625	3820	12000	13100
LEAD	4	7.2	2 U	1.8 U	1.75 U	1.7 U	4.5	4.8
MAGNESIUM	137 J	211 J	103 J	97.6 J	104.3 J	111 J	76.8 J	242 J
MANGANESE	21.8	30.9	16.8	9.5	10.3	11.1	23.7	39.4
MERCURY	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
NICKEL	1.6 U	4.9 J	1.6 U	1.6 J	1.6 J	1.6 U	1.6 J	3.8 J
POTASSIUM	110 J	103 J	67.7 UJ	68 UJ	68.05 UJ	68.1 UJ	68.9 UJ	68.9 UJ
SELENIUM	0.13 U	0.14 UJ	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
SILVER	0.55 U	0.58 U	0.54 U	0.54 U	0.54 U	0.54 U	0.55 U	0.55 U
SODIUM	23.4 U	34.2 U	25.7 U	28.6 U	27.4 U	26.2 U	26.5 U	31.2 U
THALLIUM	0.13 U	0.14 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
VANADIUM	25.3	57.1	12.5	10.3 J	10.8 J	11.3	27.6	30.8
ZINC	3.8 U	7.1	3.9 U	3.2 U	3.15 U	3.1 U	4 U	8.9
Miscellaneous Parameters (mg/kg)								
CYANIDE	0.08 U	0.09 U	0.1 U	0.13 U	0.145 U	0.16 U	0.13 U	0.08 U
TOTAL ORGANIC CARBON		897		323	284.5	246		234

APPENDIX TABLE A-11-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014									
LOCATION	BKS003	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
NSAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SAMPLE	BKS00301	BKG-SL-01	BKG-SL-02	BKG-SL-03	BKG-SL-04	BKG-SL-05	BKG-SL-06	BKG-SL-07	BKG-SL-08	BKG-SL-09
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
DEPTH RANGE	0 - 0	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2	0 - 2
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	1/9/1996	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992	8/10/1992
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Semivolatile Organics (ug/kg)										
BIS(2-ETHYLHEXYL)PHTHALATE	370 U									
Pesticides PCBs (ug/kg)										
4,4'-DDE	3.7 U	17 U	17 U	8.7 J	18 U	16 J	17 U	170 U	17 U	17 U
4,4'-DDT	3.7 U	17 U	17 U	6 J	18 U	9.6 J	17 U	170 U	17 U	17 U
ALPHA-CHLORDANE	1.9 U	85 U	87 U	90 U	88 U	1.4 J	87 U	860 U	86 U	85 U
DIELDRIN	3.7 U	17 U	17 U	18 U	18 U	9 J	17 U	170 U	17 U	23 J
GAMMA-CHLORDANE	1.9 U	85 U	87 U	90 U	88 U	5.2 J	87 U	860 U	86 U	85 U
HEPTACHLOR EPOXIDE	1.9 U	8.5 U	8.7 U	9 U	8.8 U	3.4 J	8.7 U	86 U	8.6 U	8.5 U
Inorganics (mg/kg)										
ALUMINUM	5610 J	2510	5410	12400	11100	20800	21300	6350	7900	2510
ANTIMONY	12 UJ	2.6 U	2.9 J	2.8 U	2.7 U	2.8 U	5 J	2.7 U	4.2 U	2.6 U
ARSENIC	1.2 J	0.69 J	0.91 J	1.9 J	2 J	3.1	3.7	1.2 J	1.3 J	0.58 J
BARIUM	14 J	2.7 J	7.8 J	33.9 J	11.9 J	26.8 J	26.2 J	10.5 J	9.3 J	2.4 J
BERYLLIUM	1 U	0.05 U	0.09 J	0.23 J	0.12 J	0.3 J	0.35 J	0.11 J	0.08 U	0.05 U
CADMIUM	1 U	0.58 U	0.6 U	0.62 U	0.6 U	0.62 U	0.9 U	0.59 U	0.93 U	0.58 U
CALCIUM	232 J	290 J	269 J	439 J	327 J	3750	262 J	216 J	210 J	118 J
CHROMIUM	4.1	3.4	6.2	9	7.9	16.2	16.3	4.5	5.4	2.3
COBALT	0.98 J	0.33 U	1.2 J	2.6 J	1.2 J	2.5 J	2.9 J	0.89 J	0.97 J	0.33 U
COPPER	5 UJ	2.1 J	4.6 J	5 J	3.9 J	6.3	8.5	3.9 J	5.4 J	1.8 J
IRON	3320 J	2260	3380	7720	5900	12500	12400	3400	4430	1670
LEAD	6.2 J	1.8	2.7 J	7.6	4.1 J	8.4 J	8 J	3.3	9.8 J	5.9 J
MAGNESIUM	89.5 J	88.9 J	149 J	219 J	153 J	1570	316 J	109 J	119 J	46.9 J
MANGANESE	246	44.4	66.7	976	233	698	236	314	149	14
MERCURY	0.1 U	0.04 U	0.04 U	0.04 J	0.04 U	0.04 U	0.07 J	0.03 U	0.06 U	0.04 U
NICKEL	8 U	2.3 U	2.4 U	3.1 J	2.3 U	4.2 J	5.9 J	2.3 U	3.6 U	2.3 U
POTASSIUM	1000 U	128 U	132 U	136 U	131 U	236 J	197 U	129 U	203 U	127 U
SELENIUM	0.18 J	0.4 U	0.41 U	0.42 U	0.41 U	0.42 U	0.61 U	0.4 J	0.63 U	0.39 U
SILVER	2 U	0.32 U	0.35 J	0.34 U	0.33 U	0.42 J	0.49 U	0.32 U	0.5 U	0.31 U
SODIUM	125 J	150 J	190 J	152 J	141 J	158 J	227 J	149 J	235 J	145 J
THALLIUM	2 U	0.44 U	0.45 U	0.46 U	0.45 U	0.46 U	0.67 U	0.44 U	0.69 U	0.43 U
VANADIUM	8.5 J	6.1 J	8.7 J	20.1	15.2	31.9	31.1	8.8 J	10.5 J	3.7 J
ZINC	4 UJ	4.8	7.4	9.8 J	9.7 J	11.9 J	16.3 J	7.7 J	8.7 J	5.5 J
Miscellaneous Parameters (mg/kg)										
CYANIDE	0.11 J	0.23 U	0.24 U	0.25 U	0.24 U	0.25 U	0.36 U	0.23 U	0.37 U	0.23 U

APPENDIX TABLE A-11-3
SUMMARY OF CHEMICALS DETECTED - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE									0001
LOCATION	BKG-SL-09	BKG-SL-09	BKG-SL-10	BKS001	BKS002	BKS002	BKS002	BKS004	BKS005
NSAMPLE	BKG-SL-09-AVG	BKG-SL-09-D	BKG-SL-10	BKS00101	BKS00201	BKS00201-AVG	BKS00201-D	BKS00401	BKS00501
SAMPLE	BKG-SL-09-AVG	BKG-SL-09A	BKG-SL-10	BKS00101	BKS00201	BKS00201D	BKS00201D	BKS00401	BKS00501
SUBMATRIX	SS	SS	SS	SS	SS	SS	SS	SS	SS
SACODE	AVG	DUP	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	0 - 2	0 - 2	0 - 2	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0	0 - 0
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	8/10/1992	8/10/1992	8/10/1992	1/9/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996	1/10/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Semivolatile Organics (ug/kg)									
BIS(2-ETHYLHEXYL)PHTHALATE				360 U	370 U	45 J	45 J	69 J	57 J
Pesticides PCBs (ug/kg)									
4,4'-DDE	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
4,4'-DDT	17 U	17 U	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
ALPHA-CHLORDANE	85 U	85 U	85 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
DIELDRIN	29 J	35	17 U	3.6 UJ	3.7 U	3.65 U	3.6 U	4 U	3.7 U
GAMMA-CHLORDANE	85 U	85 U	85 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
HEPTACHLOR EPOXIDE	8.5 U	8.5 U	8.5 U	1.8 UJ	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U
Inorganics (mg/kg)									
ALUMINUM	3300	4090	5040	5590 J	6640 J	5435 J	4230 J	5080 J	6330 J
ANTIMONY	3.35 U	4.1 U	2.6 U	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ	12 UJ
ARSENIC	0.655 J	0.73 J	1 J	1.6 J	1.6 J	1.295 J	0.99 J	1.2 J	1.3 J
BARIUM	3.15 J	3.9 J	5.2 J	6 J	11.4 J	10.15 J	8.9 J	10.7 J	12 J
BERYLLIUM	0.065 U	0.08 U	0.05 U	1 U	0.05 J	0.05 J	1 U	1 U	0.05 J
CADMIUM	0.745 U	0.91 U	0.9 J	1 U	0.21 J	0.21 J	1 U	1 U	0.22 J
CALCIUM	179 J	240 J	401 J	82 J	132 J	173.5 J	215 J	202 J	166 J
CHROMIUM	3.25	4.2	3.8	3.4	3.4	2.7 J	2 J	2.4 J	3.2
COBALT	0.425 U	0.52 U	0.75 J	0.78 J	1 J	1 J	10 U	10 U	1 J
COPPER	3.05 J	4.3 J	3.3 J	5 UJ	3.4 J	3.4 J	5 UJ	2.6 J	5 UJ
IRON	2225	2780	2780	3180 J	3340	2780	2220	2630	3130
LEAD	4.85 J	3.8 J	4.1 J	3.9 J	5.9	5.5	5.1	6.5	5.6
MAGNESIUM	62.85 J	78.8 J	122 J	68.8 J	124 J	98.25 J	72.5 J	88 J	120 J
MANGANESE	20.8	27.6	144	86.4	249	233	217	238	246
MERCURY	0.045 U	0.05 U	0.04 U	0.1 U	0.04 J	0.045 J	0.05 J	0.07 J	0.04 J
NICKEL	2.625 J	4.1 J	2.3 U	8 U	2.6 J	2.6 J	8 U	8 U	1.7 J
POTASSIUM	163.5 U	200 U	128 U	1000 U	96.8 J	81.3 J	65.8 J	96.8 J	87.4 J
SELENIUM	0.505 U	0.62 U	0.39 U	0.2 J	0.16 J	0.15 J	0.14 J	0.19 J	0.22 J
SILVER	0.405 U	0.5 U	0.32 U	2 U	2 U	2 U	2 U	2 U	2 U
SODIUM	181 J	217 J	144 J	143 J	184 J	265 J	346 J	216 J	196 J
THALLIUM	0.555 U	0.68 U	0.44 U	2 U	0.16 J	0.16 J	2 U	2 U	2 U
VANADIUM	4.95 J	6.2 J	6.7 J	7.5 J	8.1 J	6.55 J	5 J	6 J	7.7 J
ZINC	8.65 J	11.8 J	12.1 J	4 UJ	5.6	4.4 J	3.2 J	4.3 J	5.1
Miscellaneous Parameters (mg/kg)									
CYANIDE	0.3 U	0.37 U	0.23 U	0.14 J	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ	0.5 U

APPENDIX TABLE A-11-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE										
LOCATION	BKB001	BKB001	BKB002	BKB002	BKB003	BKB003	BKB004	BKB004	BKB004	BKB004
NSAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401-AVG	BKB00401-D	BKB00402
SAMPLE	BKB00101	BKB00102	BKB00201	BKB00202	BKB00301	BKB00302	BKB00401	BKB00401	BKB00401-D	BKB00402
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	10 - 12	5 - 7	5 - 7	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/20/1996	5/20/1996	5/20/1996	5/20/1996	5/21/1996	5/21/1996	5/20/1996	5/20/1996	5/20/1996	5/20/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Inorganics (mg/kg)										
ALUMINUM	3890	18400	16600	19800	14800	11300	3600	2945	2290	7910
ANTIMONY	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	1.9 U
ARSENIC	0.52 J	5.8	4.4	2.3	1.7 J	5.6	0.54 J	0.665 J	0.79 J	1 J
BARIUM	5.7 J	3.8 J	11.5 J	7.3 J	10.2 J	3.8 J	7.2 J	6.8 J	6.4 J	7.7 J
BERYLLIUM	0.06 U	0.07 U	0.14 J	0.13 J	0.14 J	0.1 J	0.06 U	0.05 J	0.07 J	0.07 U
CADMIUM	0.25 U	0.6 J	0.35 J	0.39 J	0.34 J	0.36 J	0.25 U	0.25 U	0.25 U	0.27 U
CALCIUM	219 J	219 J	282 J	223 J	198 J	194 J	194 J	198.5 J	203 J	216 J
CHROMIUM	4.1	21.2	11.4	12.8	10.6	10.9	3.2	2.8	2.4	5.7
COBALT	0.49 J	0.5 U	0.73 J	0.82 J	0.71 J	0.5 U	0.77 J	0.675 J	0.58 J	0.51 U
COPPER	2.7 J	5.6	4.5 J	5.7	5 J	2.9 J	1.8 J	1.75 J	1.7 J	5 J
IRON	2180	15200	8940	9870	8170	9870	2220	1940	1660	4170
LEAD	1.1 U	3.8	4.9	3.8	3	4.2	1.4 U	1.55	2.4	2 U
MAGNESIUM	147 J	80.3 J	145 J	145 J	197 J	70.7 J	114 J	103.5 J	93 J	142 J
MANGANESE	16.1	20.2	26.9	19.6	27.6	15.2	19.5	17	14.5	12.1
NICKEL	1.5 U	1.6 U	2 J	1.6 U	2.8 J	1.6 U	1.5 J	1.5 J	1.5 U	1.6 U
POTASSIUM	82 J	68.6 UJ	69.7 UJ	70.1 UJ	98.8 J	68.4 UJ	84.5 J	58.7 J	65.8 UJ	70 UJ
SELENIUM	0.12 U	0.15 J	0.13 U	0.13 U	0.13 U	0.13 U	0.12 U	0.12 U	0.12 U	0.13 U
SILVER	0.52 U	0.56 J	0.55 U	0.55 U	0.53 U	0.54 U	0.52 U	0.52 U	0.52 U	0.55 U
VANADIUM	5.2 J	38.2	21.8	26.3	19.8	24.3	4.9 J	4.15 J	3.4 J	11 J
ZINC	6.4 U	3.8 U	5.1 U	5.3 U	6.8	2.4 U	3.9 U	3.3 U	2.7 U	8.4
Miscellaneous Parameters (mg/kg)										
TOTAL ORGANIC CARBON		815		2240		531				379

APPENDIX TABLE A-11-4
SUMMARY OF CHEMICALS DETECTED - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY WIDE SUBSURFACE SOIL BACKGROUND DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	0014	0014					0032	0032
LOCATION	BKB005	BKB005	BKB006	BKB006	BKB006	BKB006	BKB007	BKB007
NSAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602-AVG	BKB00602-D	BKB00701	BKB00702
SAMPLE	BKB00501	BKB00502	BKB00601	BKB00602	BKB00602	BKB00602-D	BKB00701	BKB00702
SUBMATRIX	SB	SB	SB	SB	SB	SB	SB	SB
SACODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL
DEPTH RANGE	5 - 7	10 - 12	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	10 - 12
STATUS	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE DATE	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996	5/21/1996
COLLECTION METHOD	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
Inorganics (mg/kg)								
ALUMINUM	14500	37300	7450	5040	5545	6050	13100	21300
ANTIMONY	1.9 U	2.2 J	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ARSENIC	2.7	6.3	1.1 J	1.4 J	1.175 J	0.95 J	5.4	5.3
BARIUM	9.8 J	10.2 J	7.5 J	5.2 J	5.55 J	5.9 J	5.4 J	15.8 J
BERYLLIUM	0.13 J	0.14 J	0.13 J	0.06 U	0.06 U	0.06 U	0.09 J	0.23 J
CADMIUM	0.41 J	0.71 J	0.26 U	0.26 U	0.26 U	0.26 U	0.48 J	0.52 J
CALCIUM	220 J	222 J	223 J	210 J	202.5 J	195 J	227 J	260 J
CHROMIUM	13.1	30	5	4.5	4.6	4.7	11	15.8
COBALT	0.88 J	0.87 J	0.49 U	0.5 U	0.5 U	0.5 U	0.5 U	0.72 J
COPPER	3.8 J	9.6	2.8 J	2 J	2.15 J	2.3 J	3.7 J	6.8
IRON	10200	22500	5000	3430	3625	3820	12000	13100
LEAD	4	7.2	2 U	1.8 U	1.75 U	1.7 U	4.5	4.8
MAGNESIUM	137 J	211 J	103 J	97.6 J	104.3 J	111 J	76.8 J	242 J
MANGANESE	21.8	30.9	16.8	9.5	10.3	11.1	23.7	39.4
NICKEL	1.6 U	4.9 J	1.6 U	1.6 J	1.6 J	1.6 U	1.6 J	3.8 J
POTASSIUM	110 J	103 J	67.7 UJ	68 UJ	68.05 UJ	68.1 UJ	68.9 UJ	68.9 UJ
SELENIUM	0.13 U	0.14 UJ	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
SILVER	0.55 U	0.58 U	0.54 U	0.54 U	0.54 U	0.54 U	0.55 U	0.55 U
VANADIUM	25.3	57.1	12.5	10.3 J	10.8 J	11.3	27.6	30.8
ZINC	3.8 U	7.1	3.9 U	3.2 U	3.15 U	3.1 U	4 U	8.9
Miscellaneous Parameters (r								
TOTAL ORGANIC CARBON		897		323	284.5	246		234

APPENDIX TABLE A-11-5
SUMMARY OF DESCRIPTIVE STATISTICS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Semivolatile Organics (ug/kg)							
BIS(2-ETHYLHEXYL)PHTHALATE	3/5	45 J	69 J	360 - 370	107	57.0	BKS00401
Pesticides PCBs (ug/kg)							
4,4'-DDE	2/15	8.7 J	16 J	3.6 - 170	11.9	12.4	BKG-SL-05
4,4'-DDT	2/15	6 J	9.6 J	3.6 - 170	11.3	7.80	BKG-SL-05
ALPHA-CHLORDANE	1/15	1.4 J	1.4 J	1.8 - 860	52.2	1.40	BKG-SL-05
DIELDRIN	2/15	9 J	35	3.6 - 170	12.9	19.0	BKG-SL-09-D
GAMMA-CHLORDANE	1/15	5.2 J	5.2 J	1.8 - 860	52.4	5.20	BKG-SL-05
HEPTACHLOR EPOXIDE	1/15	3.4 J	3.4 J	1.8 - 86	5.72	3.40	BKG-SL-05
Inorganics (mg/kg)							
ALUMINUM	15/15	2510	21300	---	8277	8277	BKG-SL-06
ANTIMONY	2/15	2.9 J	5 J	2.6 - 12	3.32	3.95	BKG-SL-06
ARSENIC	15/15	0.58 J	3.7	---	1.54	1.54	BKG-SL-06
BARIUM	15/15	2.4 J	33.9 J	---	12.7	12.7	BKG-SL-03
BERYLLIUM	8/15	0.05 J	0.35 J	0.05 - 1	0.195	0.163	BKG-SL-06
CADMIUM	3/15	0.21 J	0.9 J	0.58 - 1	0.395	0.443	BKG-SL-10
CALCIUM	15/15	82 J	3750	---	480	480	BKG-SL-05
CHROMIUM	15/15	2 J	16.3	---	6.12	6.12	BKG-SL-06
COBALT	12/15	0.75 J	2.9 J	0.33 - 10	1.48	1.40	BKG-SL-06
COPPER	12/15	1.8 J	8.5	5	3.97	4.34	BKG-SL-06
IRON	15/15	1670	12500	---	4802	4802	BKG-SL-05
LEAD	15/15	1.8	9.8 J	---	5.49	5.49	BKG-SL-08
MAGNESIUM	15/15	46.9 J	1570	---	225	225	BKG-SL-05
MANGANESE	15/15	14	976	---	262	262	BKG-SL-03
MERCURY	5/15	0.04 J	0.07 J	0.03 - 0.1	0.0355	0.0530	BKS00401, BKG-SL-06
NICKEL	6/15	1.7 J	5.9 J	2.3 - 8	2.65	3.35	BKG-SL-06
POTASSIUM	4/15	65.8 J	236 J	127 - 1000	145	125	BKG-SL-05
SELENIUM	6/15	0.14 J	0.4 J	0.39 - 0.63	0.229	0.223	BKG-SL-07
SILVER	2/15	0.35 J	0.42 J	0.31 - 2	0.486	0.385	BKG-SL-05
SODIUM	15/15	125 J	346 J	---	178	178	BKS00201-D
THALLIUM	1/15	0.16 J	0.16 J	0.43 - 2	0.446	0.160	BKS00201
VANADIUM	15/15	3.7 J	31.9	---	12.0	12.0	BKG-SL-05
ZINC	13/15	3.2 J	16.3 J	4	7.66	8.53	BKG-SL-06
Miscellaneous Parameters (mg/kg)							
CYANIDE	2/15	0.11 J	0.14 J	0.23 - 0.5	0.157	0.125	BKS00101

APPENDIX TABLE A-11-6
SUMMARY OF DESCRIPTIVE STATISTICS
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SUBSURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Frequency of Detection	Minimum Concentration	Maximum Concentration	Range of Nondetects	Mean Concentration	Average of Positive hits	Sample of Maximum Detection
Inorganics (mg/kg)							
ALUMINUM	14/14	2290	37300	---	13917	13917	BKB00502
ANTIMONY	1/14	2.2 J	2.2 J	1.8 - 1.9	1.03	2.20	BKB00502
ARSENIC	14/14	0.52 J	6.3	---	3.14	3.14	BKB00502
BARIUM	14/14	3.8 J	15.8 J	---	7.93	7.93	BKB00702
BERYLLIUM	10/14	0.07 J	0.23 J	0.06 - 0.07	0.101	0.128	BKB00702
CADMIUM	9/14	0.34 J	0.71 J	0.25 - 0.27	0.343	0.462	BKB00502
CALCIUM	14/14	194 J	282 J	---	222	222	BKB00201
CHROMIUM	14/14	2.4	30	---	11.4	11.4	BKB00502
COBALT	8/14	0.49 J	0.88 J	0.49 - 0.51	0.528	0.737	BKB00501
COPPER	14/14	1.7 J	9.6	---	4.43	4.43	BKB00502
IRON	14/14	1660	22500	---	9055	9055	BKB00502
LEAD	10/14	2.4	7.2	1.1 - 2	3.23	4.18	BKB00502
MAGNESIUM	14/14	70.7 J	242 J	---	136	136	BKB00702
MANGANESE	14/14	9.5	39.4	---	21.3	21.3	BKB00702
NICKEL	7/14	1.5 J	4.9 J	1.5 - 1.6	1.70	2.60	BKB00502
POTASSIUM	5/14	82 J	110 J	65.8 - 70.1	54.5	90.5	BKB00501
SELENIUM	1/14	0.15 J	0.15 J	0.12 - 0.14	0.0707	0.150	BKB00102
SILVER	1/14	0.56 J	0.56 J	0.52 - 0.58	0.293	0.560	BKB00102
VANADIUM	14/14	3.4 J	57.1	---	22.5	22.5	BKB00502
ZINC	4/14	6.8	8.9	2.4 - 6.4	3.70	7.80	BKB00702
Miscellaneous Parameter (mg/kg)							
TOTAL ORGANIC CARBON	7/7	234	2240	---	769	769	BKB00202

APPENDIX TABLE A-11-7
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
BIS(2-ETHYLHEXYL)PHTHALATE	**5**	**3**	**45**	**69.0**	**107**	**57.0**	**69.3**	**0.544**	**Data are Normal (0.05)**	**173**	**Student-t**	**UCL > Max Detect**
4,4'-DDE	**15**	**2**	**8.7**	**16.0**	**11.9**	**12.4**	**20.6**	**3.62**	**Data are Non-parametric (0.05)**	**64.9**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
4,4'-DDT	**15**	**2**	**6**	**9.60**	**11.3**	**7.80**	**20.6**	**3.71**	**Data are Non-parametric (0.05)**	**64.3**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
ALPHA-CHLORDANE	**15**	**1**	**1.4**	**1.40**	**52.2**	**1.40**	**107**	**3.61**	**Data are Non-parametric (0.05)**	**326**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
DIELDRIN	**15**	**2**	**9**	**29.0**	**12.9**	**19.0**	**21.1**	**3.29**	**Data are Non-parametric (0.05)**	**67.0**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
GAMMA-CHLORDANE	**15**	**1**	**5.2**	**5.20**	**52.4**	**5.20**	**106**	**3.62**	**Data are Non-parametric (0.05)**	**326**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
HEPTACHLOR EPOXIDE	**15**	**1**	**3.4**	**3.40**	**5.72**	**3.40**	**10.4**	**3.72**	**Data are Non-parametric (0.05)**	**32.5**	**99% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
ALUMINUM	15	15	2510	21300	8277	8277	5784	1.61	Data are Lognormal (0.05)	11724	H-UCL	- -
ANTIMONY	**15**	**2**	**2.9**	**5.00**	**3.32**	**3.95**	**2.18**	**0.391**	**Data are Non-parametric (0.05)**	**5.77**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
ARSENIC	15	15	0.655	3.70	1.54	1.54	0.852	1.63	Data Follow Gamma Distribution (0.05)	1.95	Approximate Gamma 95% UCL	- -
BARIUM	15	15	2.7	33.9	12.7	12.7	9.17	1.29	Data Follow Gamma Distribution (0.05)	17.8	Approximate Gamma 95% UCL	- -
BERYLLIUM	**15**	**8**	**0.05**	**0.350**	**0.195**	**0.163**	**0.187**	**0.809**	**Data Follow Gamma Distribution (0.05)**	**0.326**	**Approximate Gamma 95% UCL**	**Max ND > UCL**
CADMIUM	**15**	**3**	**0.21**	**0.900**	**0.395**	**0.443**	**0.172**	**1.88**	**Data Follow Gamma Distribution (0.05)**	**0.476**	**Approximate Gamma 95% UCL**	**Max ND > UCL**
CALCIUM	15	15	82	3750	480	480	909	3.81	Data are Non-parametric (0.05)	1503	95% Chebyshev(Mean, Std) UCL	- -
CHROMIUM	15	15	2.4	16.3	6.12	6.12	4.52	1.70	Data Follow Gamma Distribution (0.05)	8.34	Approximate Gamma 95% UCL	- -
COBALT	15	12	0.75	2.90	1.48	1.40	1.27	1.75	Data Follow Gamma Distribution (0.05)	2.22	Approximate Gamma 95% UCL	Max ND > UCL
COPPER	15	12	2.1	8.50	3.97	4.34	1.75	1.38	Data Follow Gamma Distribution (0.05)	4.83	Approximate Gamma 95% UCL	Max ND > UCL
IRON	15	15	2225	12500	4802	4802	3427	1.72	Data are Non-parametric (0.05)	8660	95% Chebyshev(Mean, Std) UCL	- -
LEAD	15	15	1.8	9.80	5.49	5.49	2.27	0.275	Data are Normal (0.05)	6.52	Student-t	- -
MAGNESIUM	15	15	62.85	1570	225	225	378	3.69	Data are Non-parametric (0.05)	650	95% Chebyshev(Mean, Std) UCL	- -
MANGANESE	15	15	20.8	976	262	262	255	2.03	Data Follow Gamma Distribution (0.05)	410	Approximate Gamma 95% UCL	- -
MERCURY	**15**	**5**	**0.04**	**0.070**	**0.036**	**0.053**	**0.018**	**0.786**	**Data are Lognormal (0.05)**	**0.047**	**H-UCL**	**Max ND > UCL**
NICKEL	**15**	**6**	**1.7**	**5.90**	**2.65**	**3.35**	**1.50**	**0.680**	**Data Follow Gamma Distribution (0.05)**	**3.49**	**Approximate Gamma 95% UCL**	**Max ND > UCL**
POTASSIUM	**15**	**4**	**81.3**	**236**	**145**	**125**	**150**	**2.09**	**Data are Non-parametric (0.05)**	**314**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
SELENIUM	**15**	**6**	**0.15**	**0.400**	**0.229**	**0.223**	**0.064**	**1.63**	**Data are Lognormal (0.05)**	**0.258**	**Student's-t, modified-t or H-UCL**	**Max ND > UCL**
SILVER	**15**	**2**	**0.35**	**0.420**	**0.486**	**0.385**	**0.384**	**0.673**	**Data are Non-parametric (0.05)**	**0.917**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
SODIUM	15	15	125	265	178	178	41.7	0.748	Data are Normal (0.05)	197	Student-t	- -
THALLIUM	**15**	**1**	**0.16**	**0.160**	**0.446**	**0.160**	**0.349**	**1.11**	**Data are Non-parametric (0.05)**	**0.839**	**95% Chebyshev(Mean, Std) UCL**	**UCL > Max Detect**
VANADIUM	15	15	4.95	31.9	12.0	12.0	8.82	1.68	Data are Non-parametric (0.05)	21.9	95% Chebyshev(Mean, Std) UCL	- -
ZINC	15	13	4.3	16.3	7.66	8.53	4.00	0.459	Data are Normal (0.05)	9.48	Student-t	- -
CYANIDE	**15**	**2**	**0.11**	**0.140**	**0.157**	**0.125**	**0.053**	**1.08**	**Data are Non-parametric (0.05)**	**0.181**	**Student-t or Modified-t UCL**	**UCL > Max Detect**

Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
1/2 the detection limit was used for B qualified data.

Associated Samples

BKS00301	BKG-SL-05	BKG-SL-10
BKG-SL-01	BKG-SL-06	BKS00101
BKG-SL-02	BKG-SL-07	BKS00201-AVG
BKG-SL-03	BKG-SL-08	BKS00401
BKG-SL-04	BKG-SL-09-AVG	BKS00501

APPENDIX TABLE A-11-8
SUMMARY OF EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SUBSURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

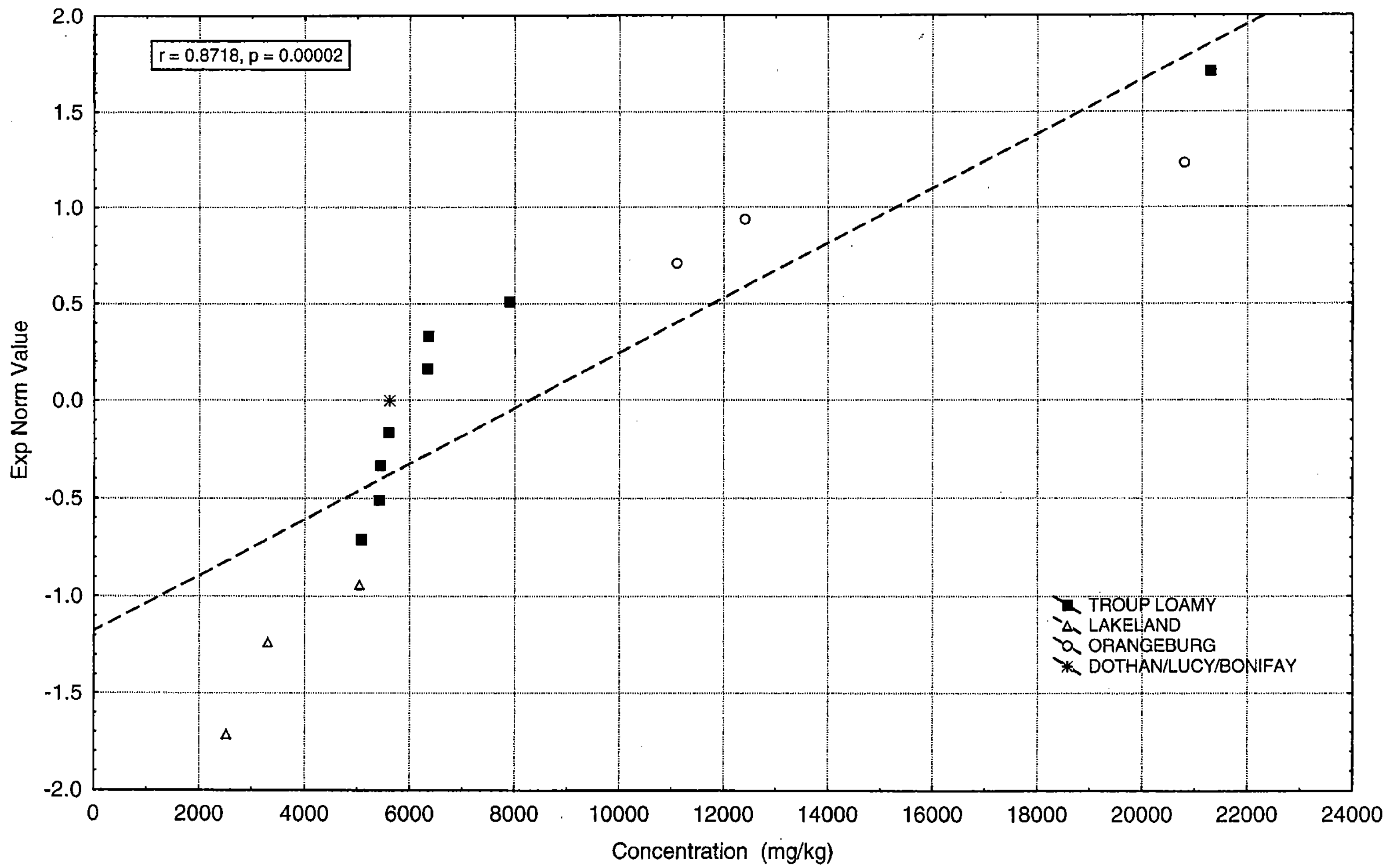
Chemical	Raw Statistics								Data Distribution	EPA's ProUCL Recommended UCL to Use		Comments
	Number of Samples	Number of Detections	Mininum Detected	Maximum Detected	Mean of All Samples	Mean of Positive Detects	Standard Deviation	Skewness				
ALUMINUM	14	14	2945	37300	13917	13917	8947	1.26	Data are Normal (0.05)	18152	Student-t	- -
ANTIMONY	**14**	**1**	**2.2**	**2.20**	**1.03**	**2.20**	**0.338**	**3.72**	**Data are Non-parametric (0.05)**	**1.19**	**Student-t or Modified-t UCL**	**Max ND > UCL**
ARSENIC	14	14	0.52	6.30	3.14	3.14	2.20	0.220	Data Follow Gamma Distribution (0.05)	4.73	Approximate Gamma 95% UCL	- -
BARIUM	14	14	3.8	15.8	7.93	7.93	3.30	0.945	Data are Normal (0.05)	9.49	Student-t	- -
BERYLLIUM	14	10	0.05	0.230	0.101	0.128	0.059	0.442	Data are Normal (0.05)	0.129	Student-t	- -
CADMIUM	**14**	**9**	**0.34**	**0.710**	**0.343**	**0.462**	**0.194**	**0.317**	**Data are Normal (0.05)**	**0.435**	**Student-t**	**- -**
CALCIUM	14	14	194	282	222	222	23.9	1.45	Data are Non-parametric (0.05)	233	Student-t or Modified-t UCL	- -
CHROMIUM	14	14	2.8	30.0	11.4	11.4	7.41	1.27	Data are Normal (0.05)	14.9	Student-t	- -
COBALT	**14**	**8**	**0.49**	**0.880**	**0.528**	**0.737**	**0.267**	**0.016**	**Data are Non-parametric (0.05)**	**0.839**	**95% Chebyshev(Mean, Std) UCL**	**- -**
COPPER	14	14	1.75	9.60	4.43	4.43	2.10	1.08	Data are Normal (0.05)	5.42	Student-t	- -
IRON	14	14	1940	22500	9055	9055	5648	0.861	Data are Normal (0.05)	11728	Student-t	- -
LEAD	14	10	1.55	7.20	3.23	4.18	1.97	0.190	Data are Normal (0.05)	4.16	Student-t	- -
MAGNESIUM	14	14	70.7	242	136	136	51.8	0.695	Data are Normal (0.05)	161	Student-t	- -
MANGANESE	14	14	10.3	39.4	21.3	21.3	7.89	0.859	Data are Normal (0.05)	25.0	Student-t	- -
NICKEL	**14**	**7**	**1.5**	**4.90**	**1.70**	**2.60**	**1.29**	**1.59**	**Data are Non-parametric (0.05)**	**3.20**	**95% Chebyshev(Mean, Std) UCL**	**- -**
POTASSIUM	**14**	**5**	**58.7**	**110**	**54.5**	**90.5**	**30.1**	**1.06**	**Data are Non-parametric (0.05)**	**68.7**	**Student-t or Modified-t UCL**	**Max ND > UCL**
SELENIUM	**14**	**1**	**0.15**	**0.150**	**0.071**	**0.150**	**0.023**	**3.67**	**Data are Non-parametric (0.05)**	**0.082**	**Student-t or Modified-t UCL**	**Max ND > UCL**
SILVER	**14**	**1**	**0.56**	**0.560**	**0.293**	**0.560**	**0.077**	**3.68**	**Data are Non-parametric (0.05)**	**0.329**	**Student-t or Modified-t UCL**	**Max ND > UCL**
VANADIUM	14	14	4.15	57.1	22.5	22.5	14.1	0.986	Data are Normal (0.05)	29.2	Student-t	- -
ZINC	**14**	**4**	**6.8**	**8.90**	**3.70**	**7.80**	**2.78**	**1.07**	**Data are Non-parametric (0.05)**	**6.94**	**95% Chebyshev(Mean, Std) UCL**	**- -**
TOTAL ORGANIC CARBON	7	7	234	2240	769	769	697	1.97	Data Follow Gamma Distribution (0.05)	1518	Approximate Gamma 95% UCL	- -

Bolded shaded values indicate that frequency of detection is less than 70 percent.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
1/2 the detection limit was used for B qualified data.

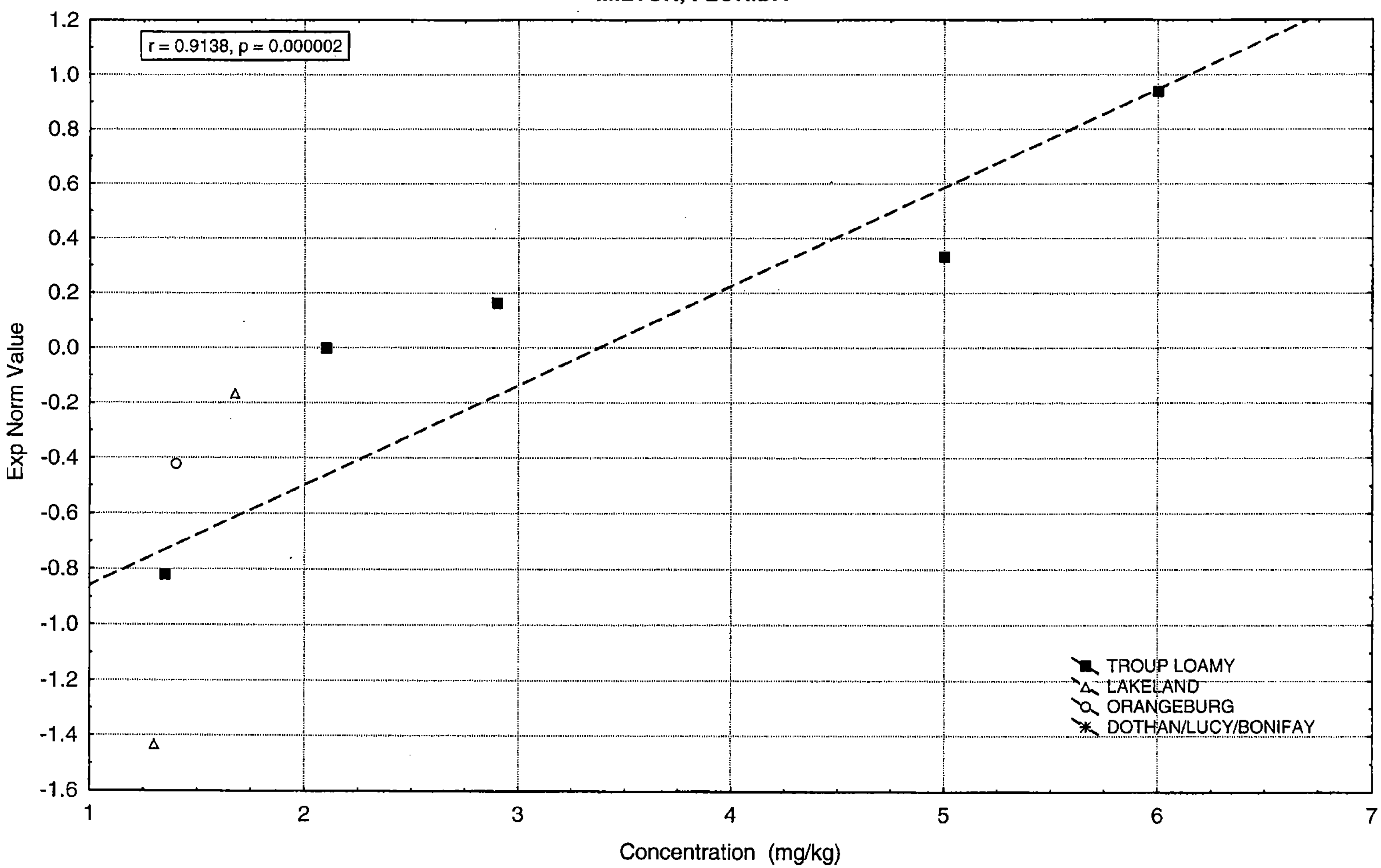
Associated Samples

BKB00101	BKB00302	BKB00601
BKB00102	BKB00401-AVG	BKB00602-AVG
BKB00201	BKB00402	BKB00701
BKB00202	BKB00501	BKB00702
BKB00301	BKB00502	

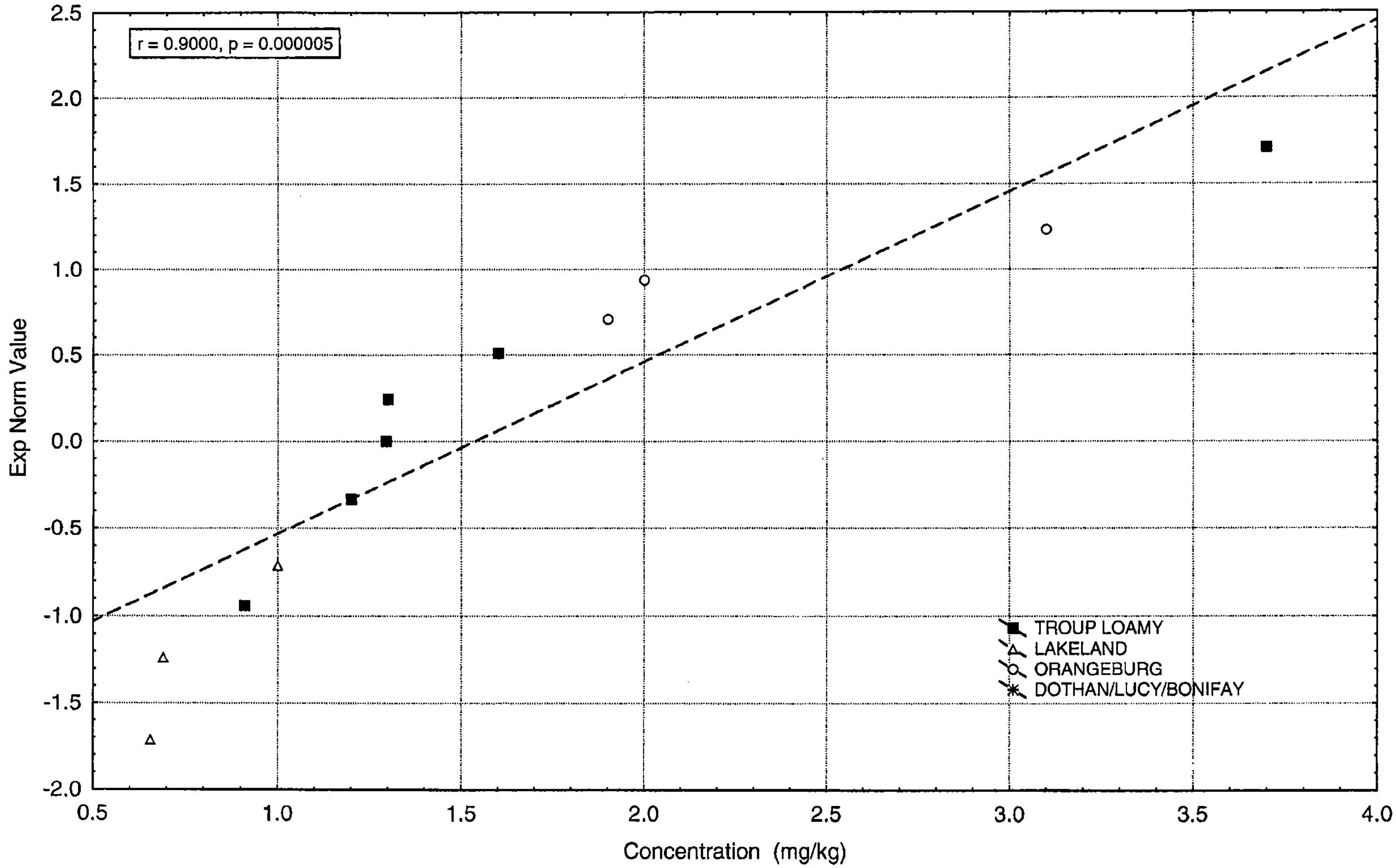
APPENDIX FIGURE A-11-1
NORMAL PROBABILITY PLOT - ALUMINUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



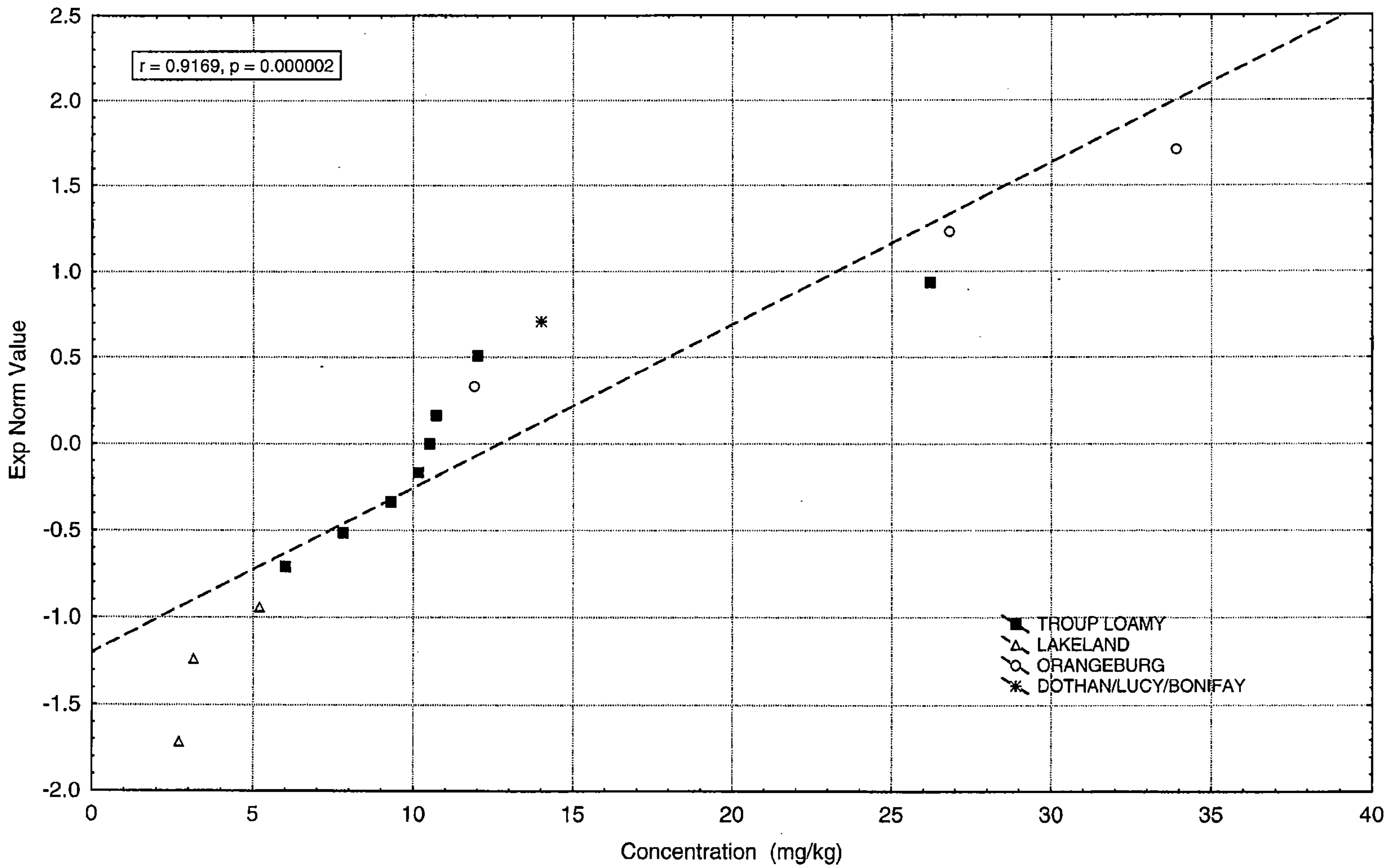
APPENDIX FIGURE A-11-2
NORMAL PROBABILITY PLOT - ANTIMONY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



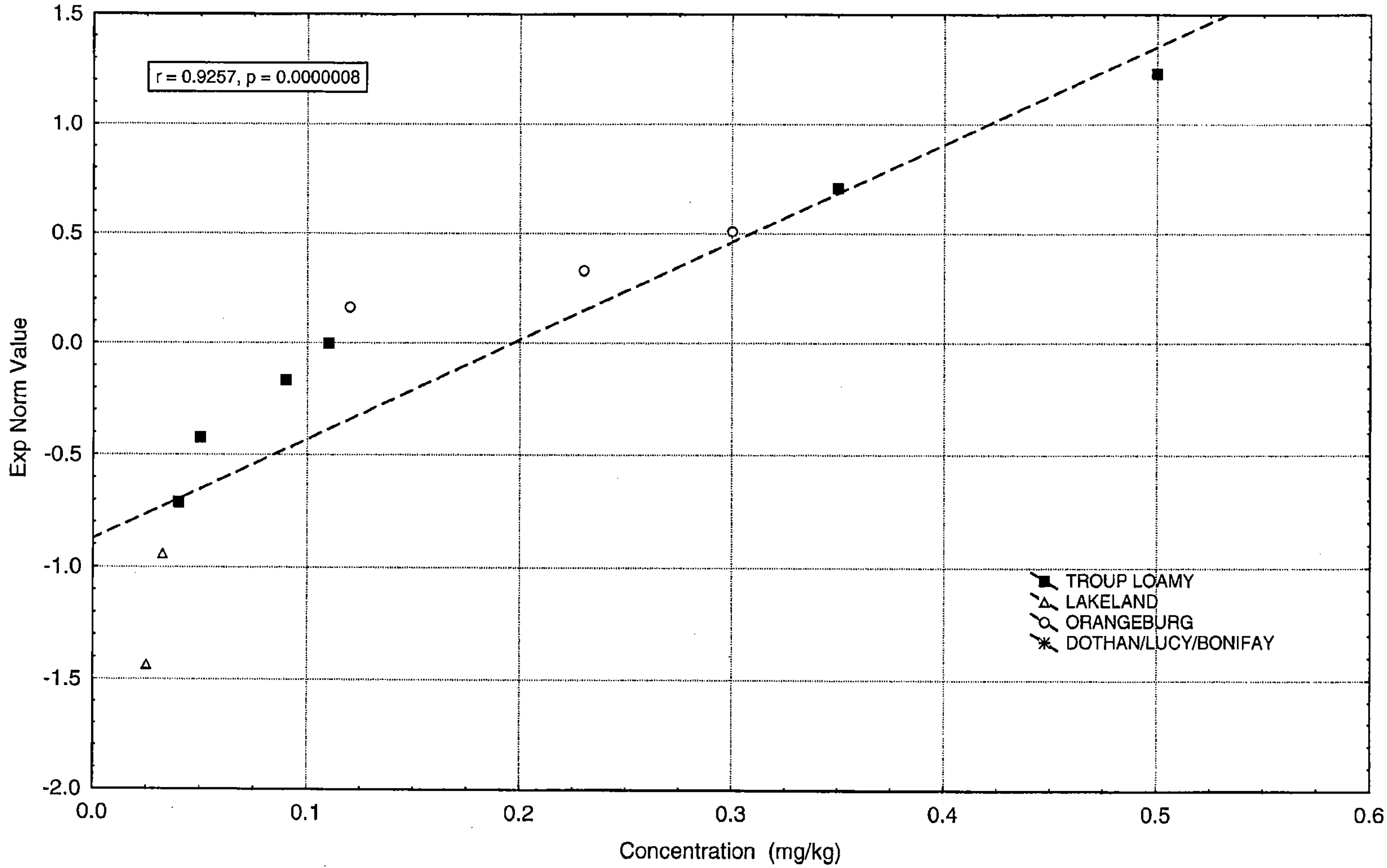
APPENDIX FIGURE A-11-3
NORMAL PROBABILITY PLOT - ARSENIC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



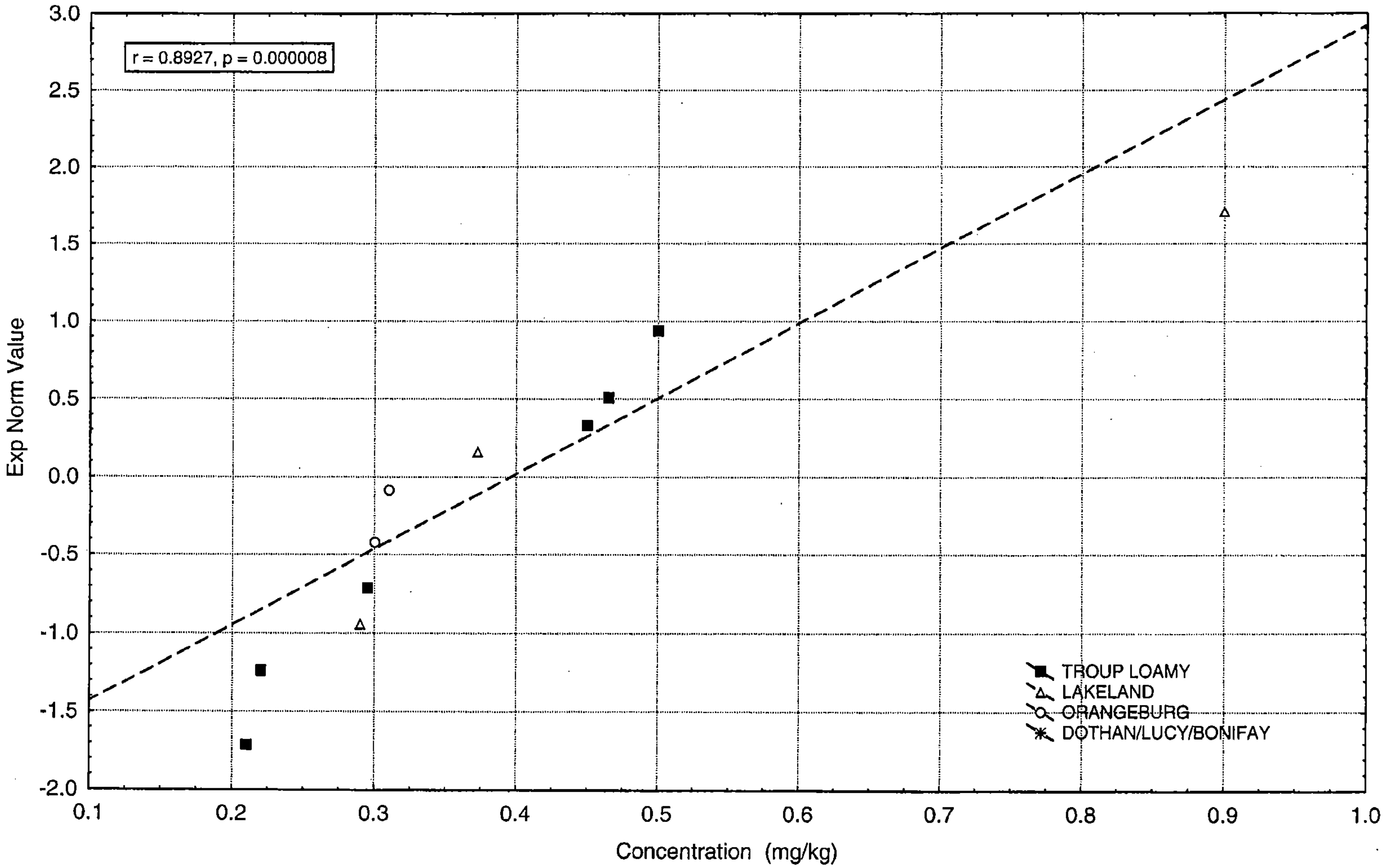
APPENDIX FIGURE A-11-4
NORMAL PROBABILITY PLOT - BARIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



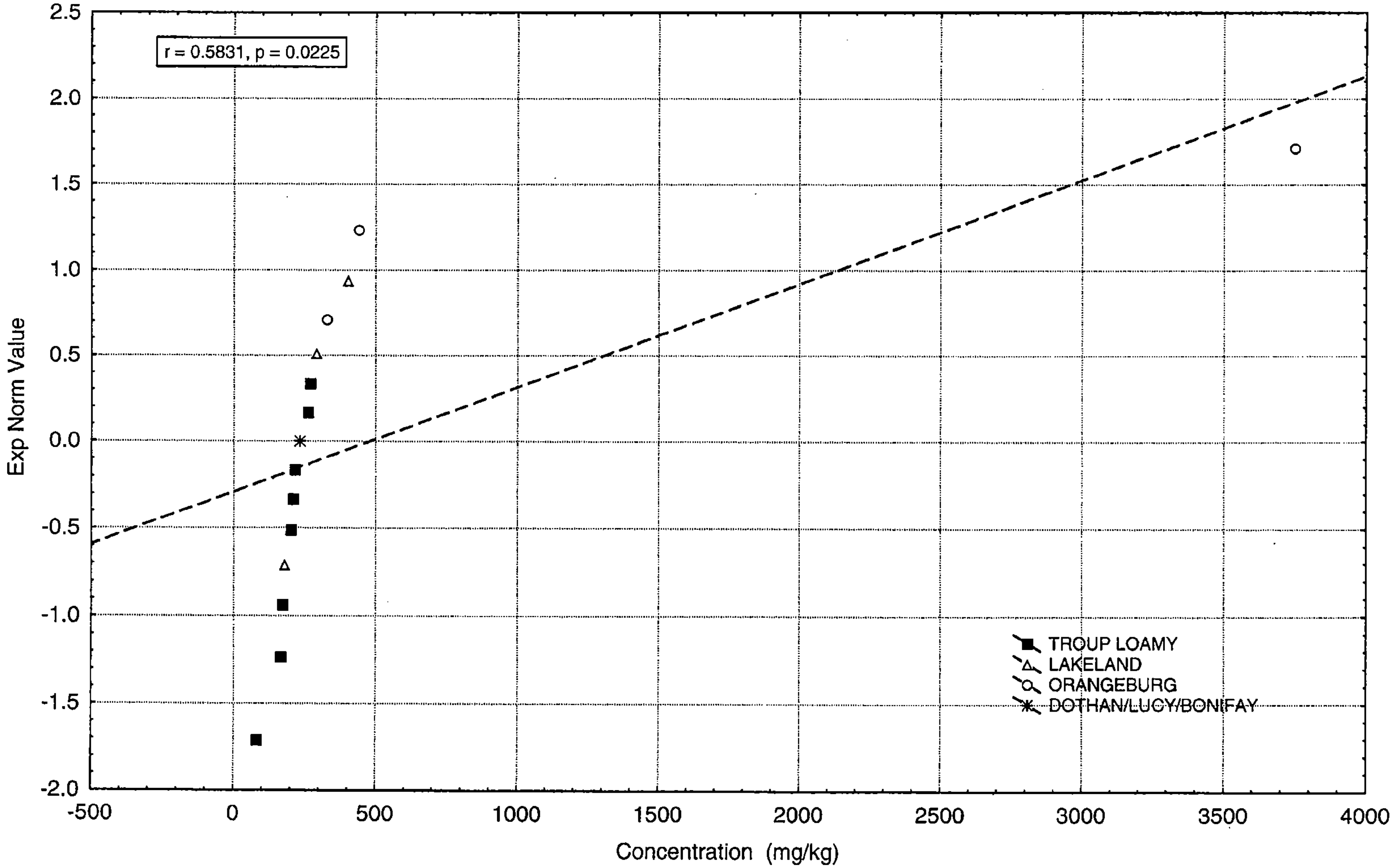
APPENDIX FIGURE A-11-5
NORMAL PROBABILITY PLOT - BERYLLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



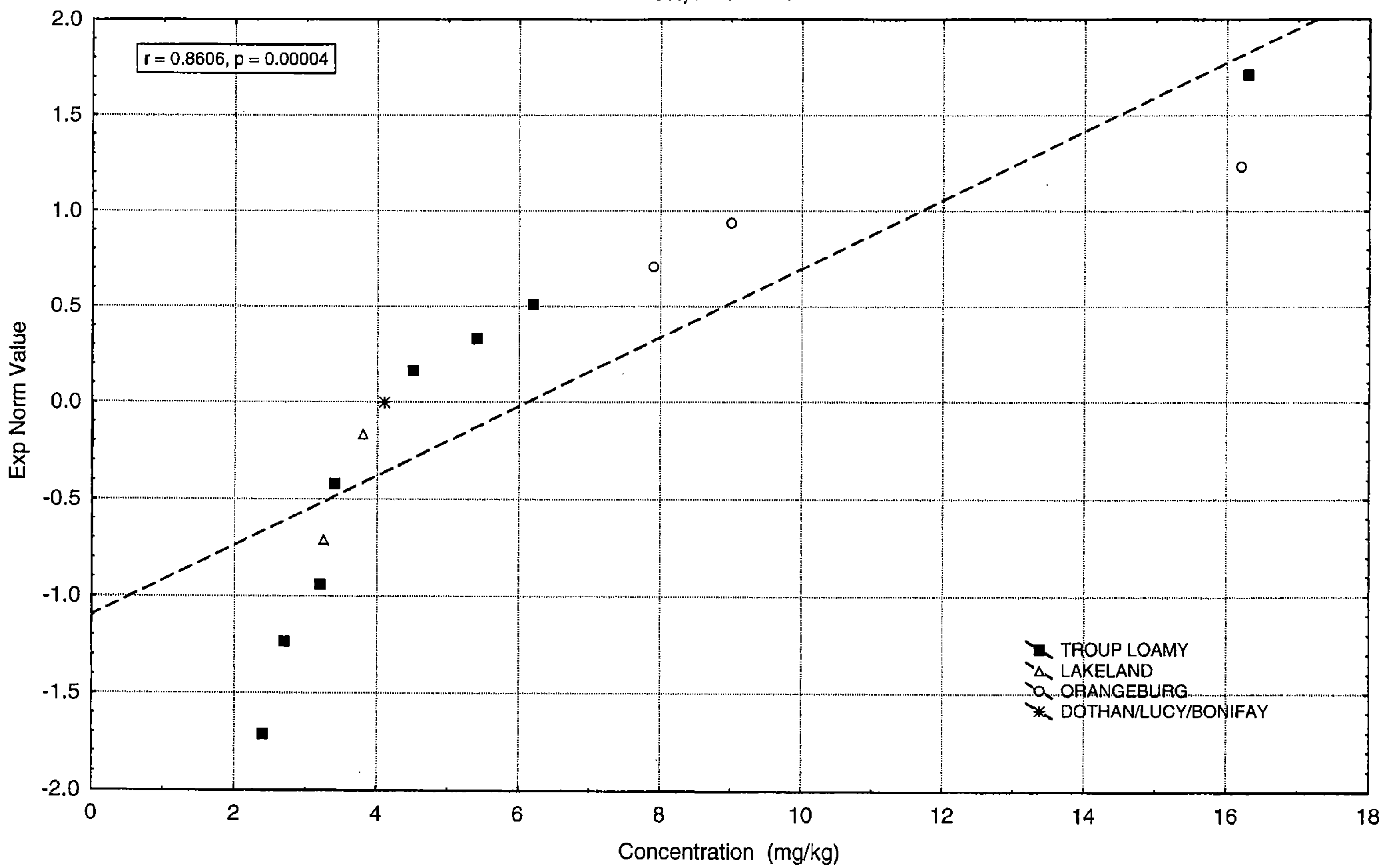
APPENDIX FIGURE A-11-6
NORMAL PROBABILITY PLOT - CADMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



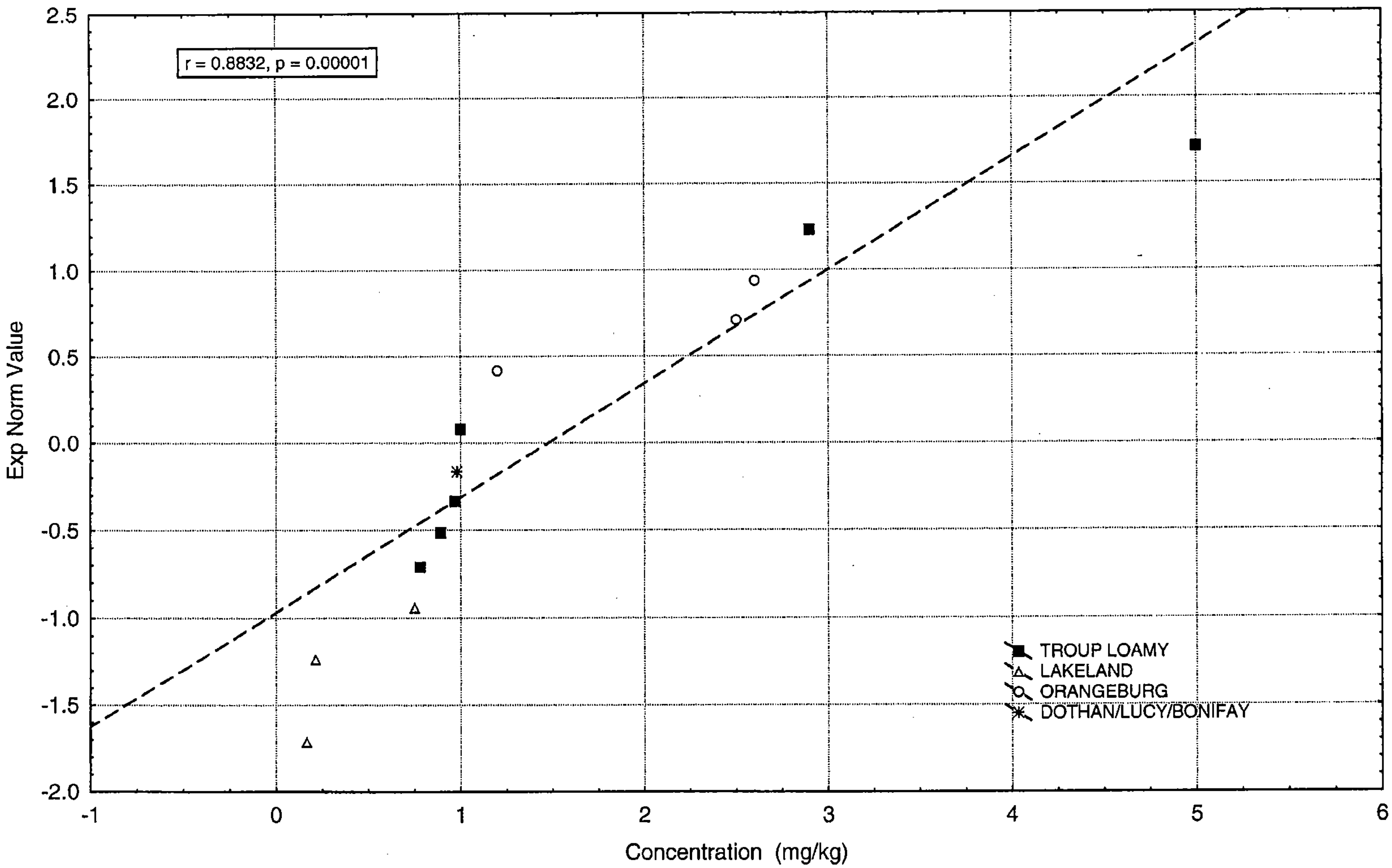
APPENDIX FIGURE A-11-7
NORMAL PROBABILITY PLOT - CALCIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



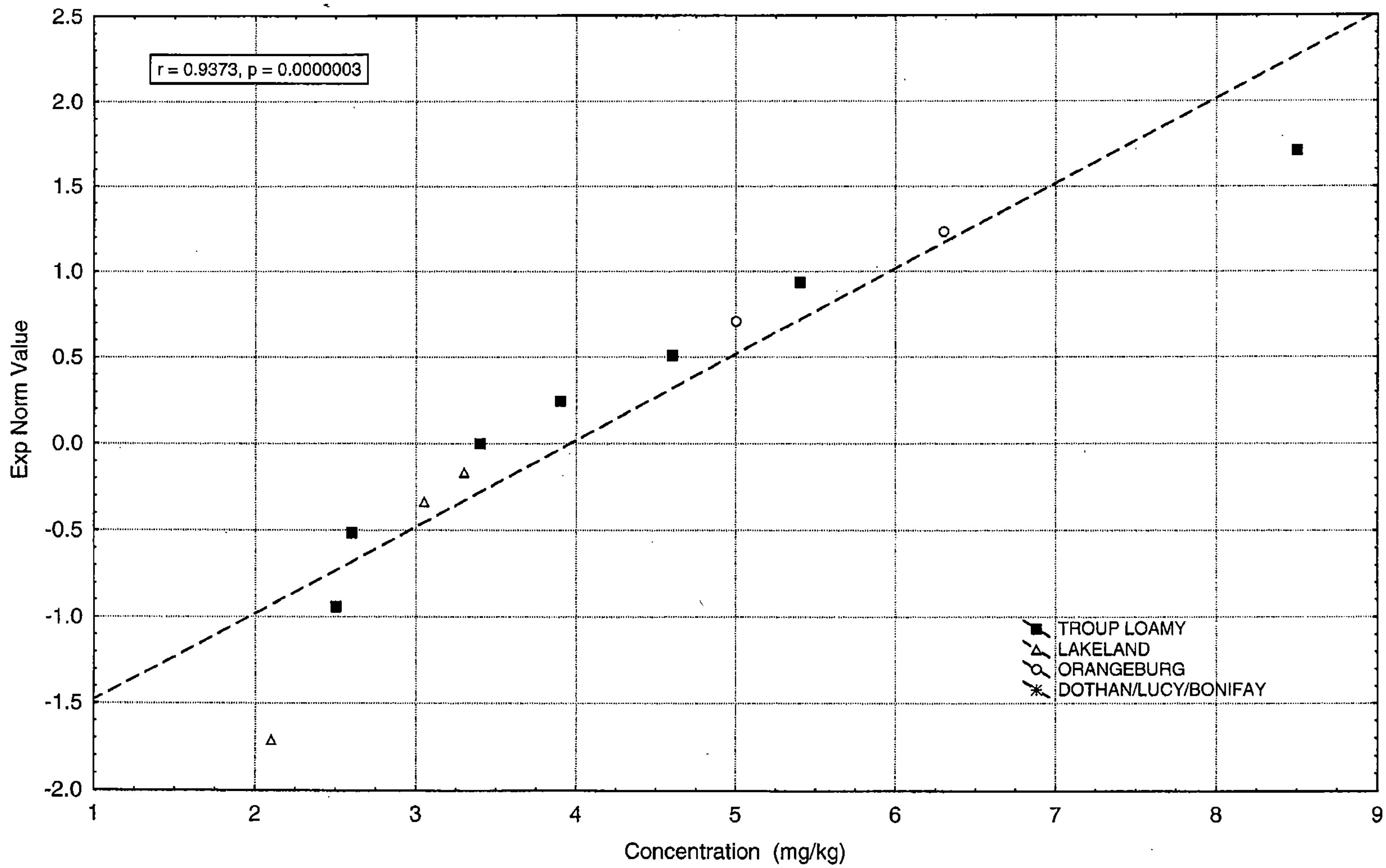
APPENDIX FIGURE A-11-8
NORMAL PROBABILITY PLOT - CHROMIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



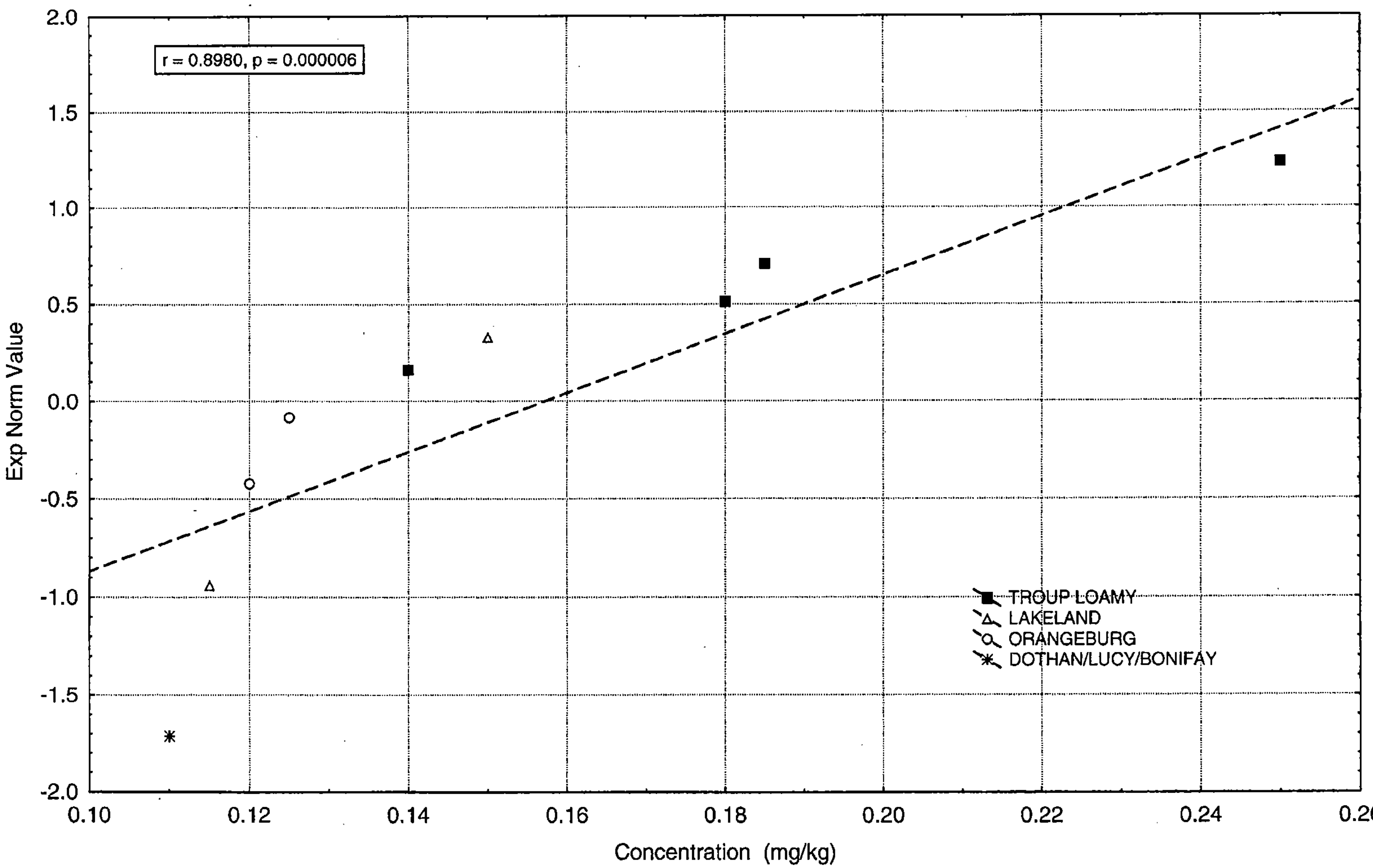
APPENDIX FIGURE A-11-9
NORMAL PROBABILITY PLOT - COBALT - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



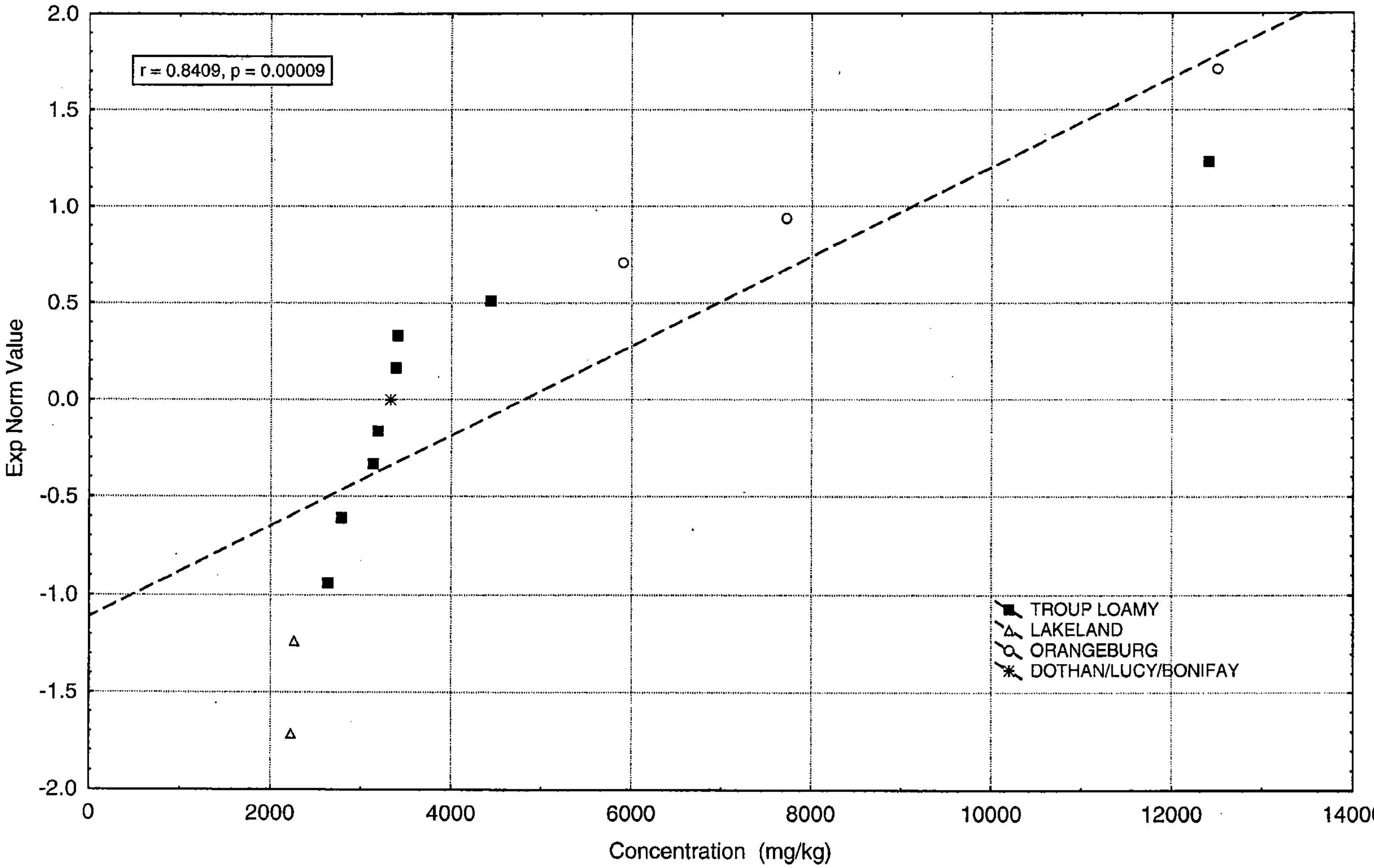
APPENDIX FIGURE A-11-10
NORMAL PROBABILITY PLOT - COPPER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



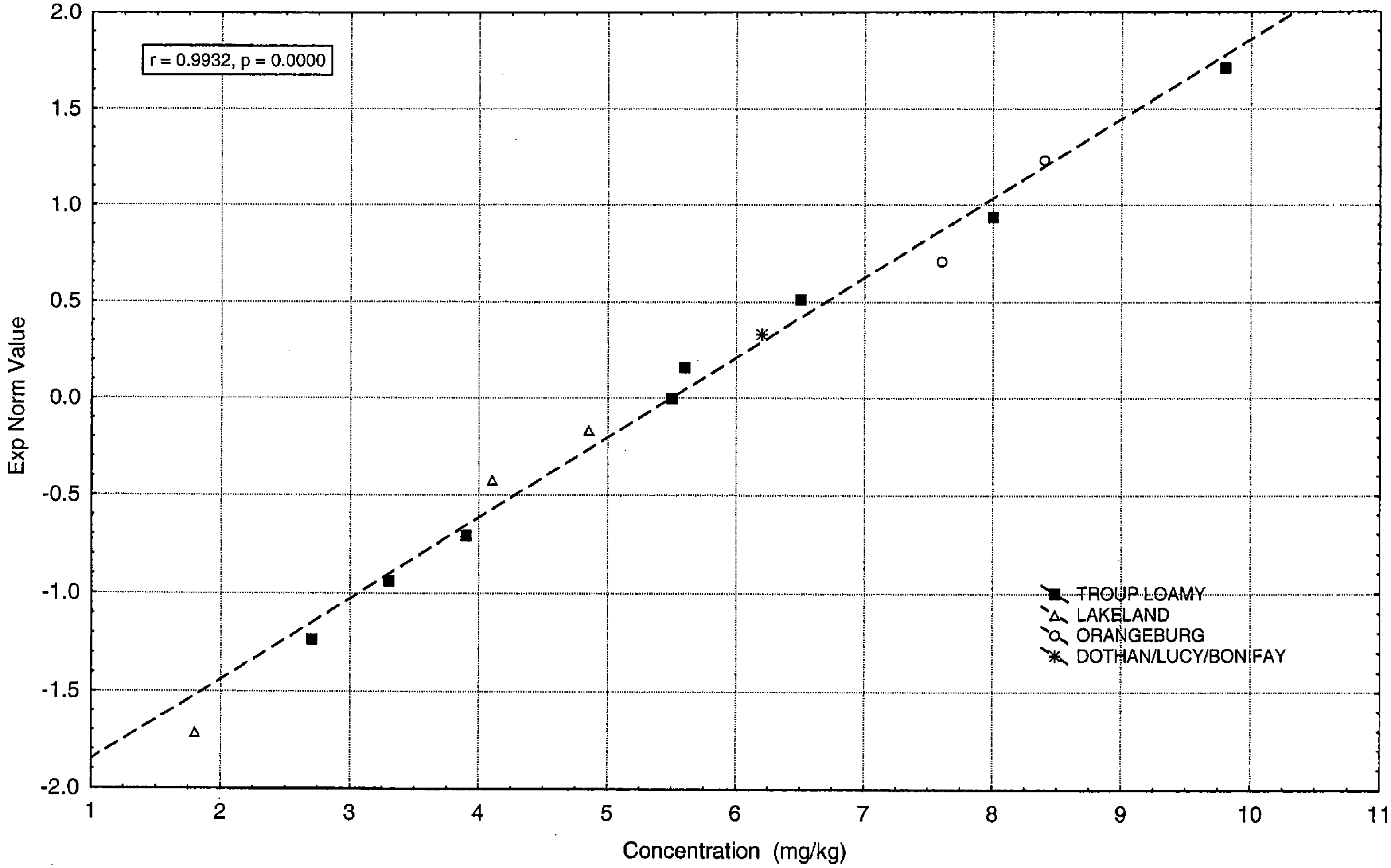
APPENDIX FIGURE A-11-11
NORMAL PROBABILITY PLOT - CYANIDE - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



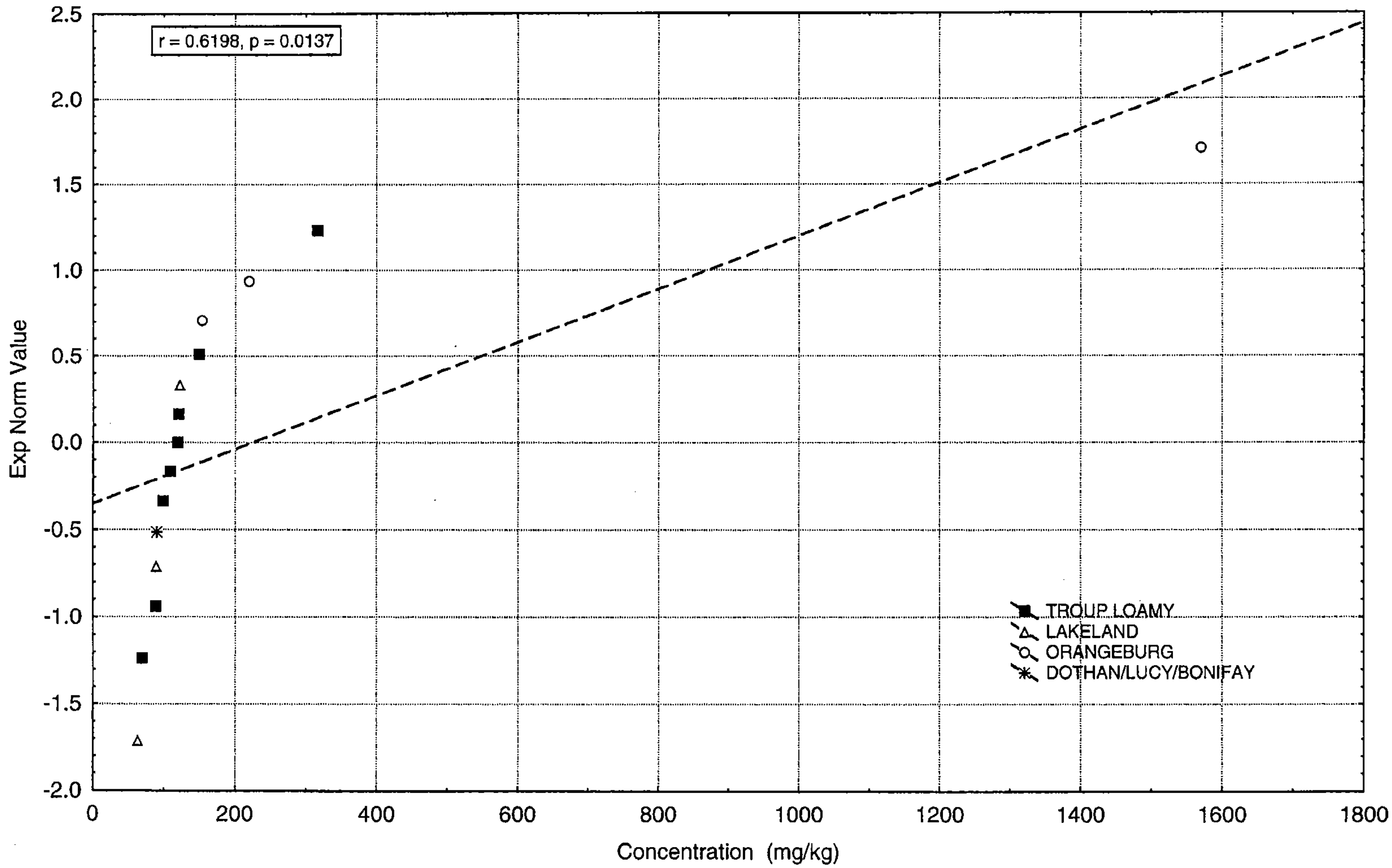
APPENDIX FIGURE A-11-12
NORMAL PROBABILITY PLOT - IRON - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



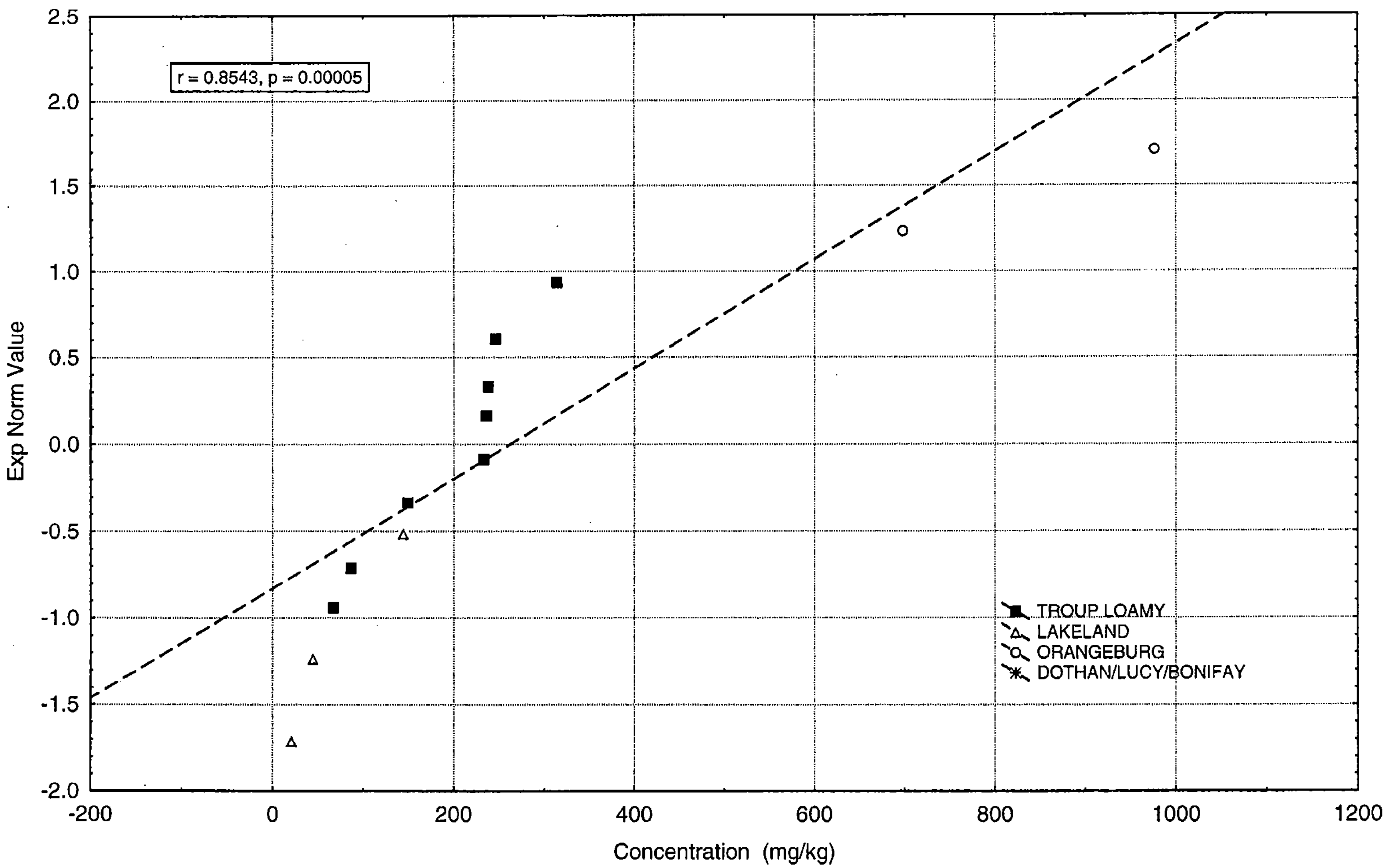
APPENDIX FIGURE A-11-13
NORMAL PROBABILITY PLOT - LEAD - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



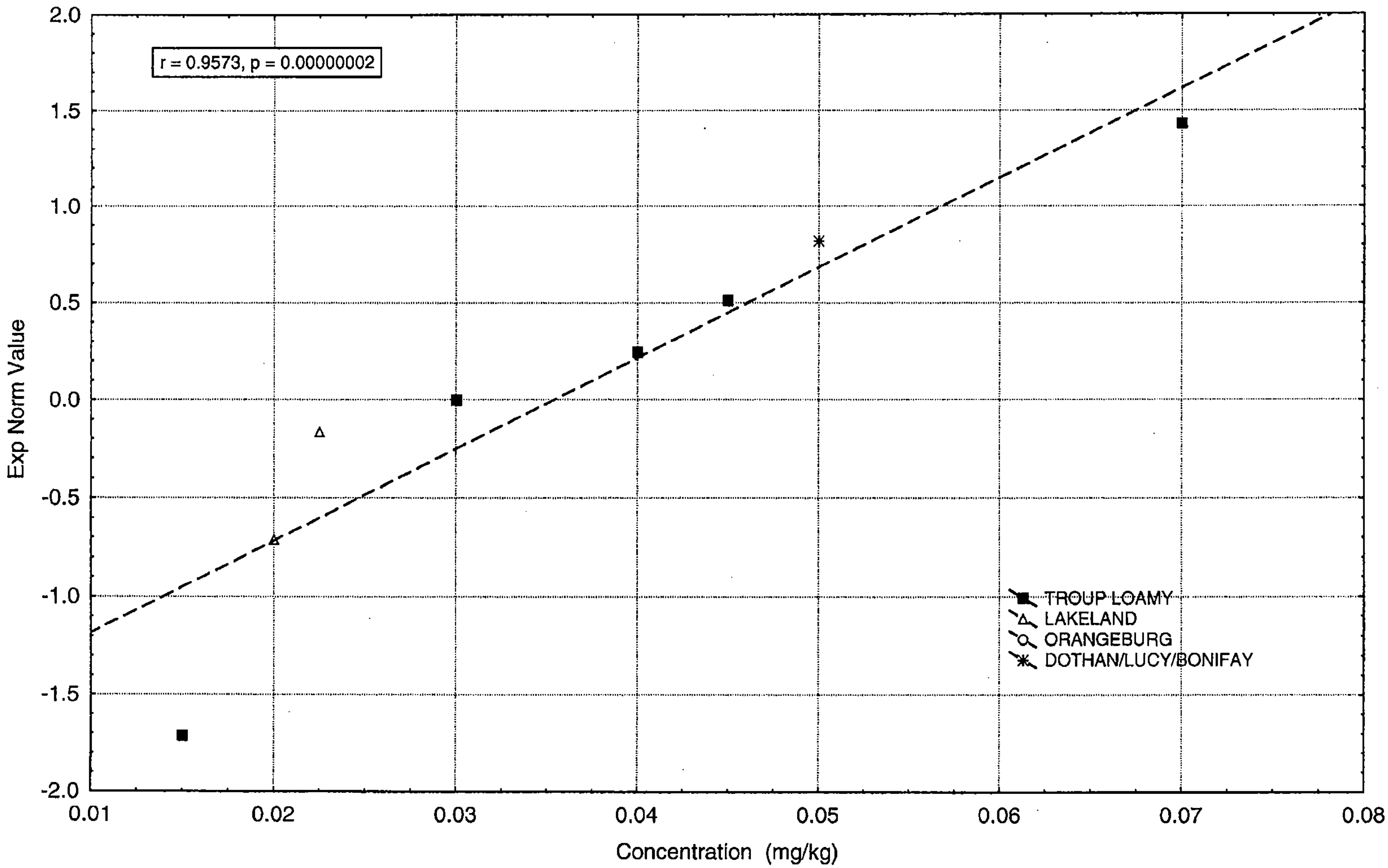
APPENDIX FIGURE A-11-14
NORMAL PROBABILITY PLOT - MAGNESIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



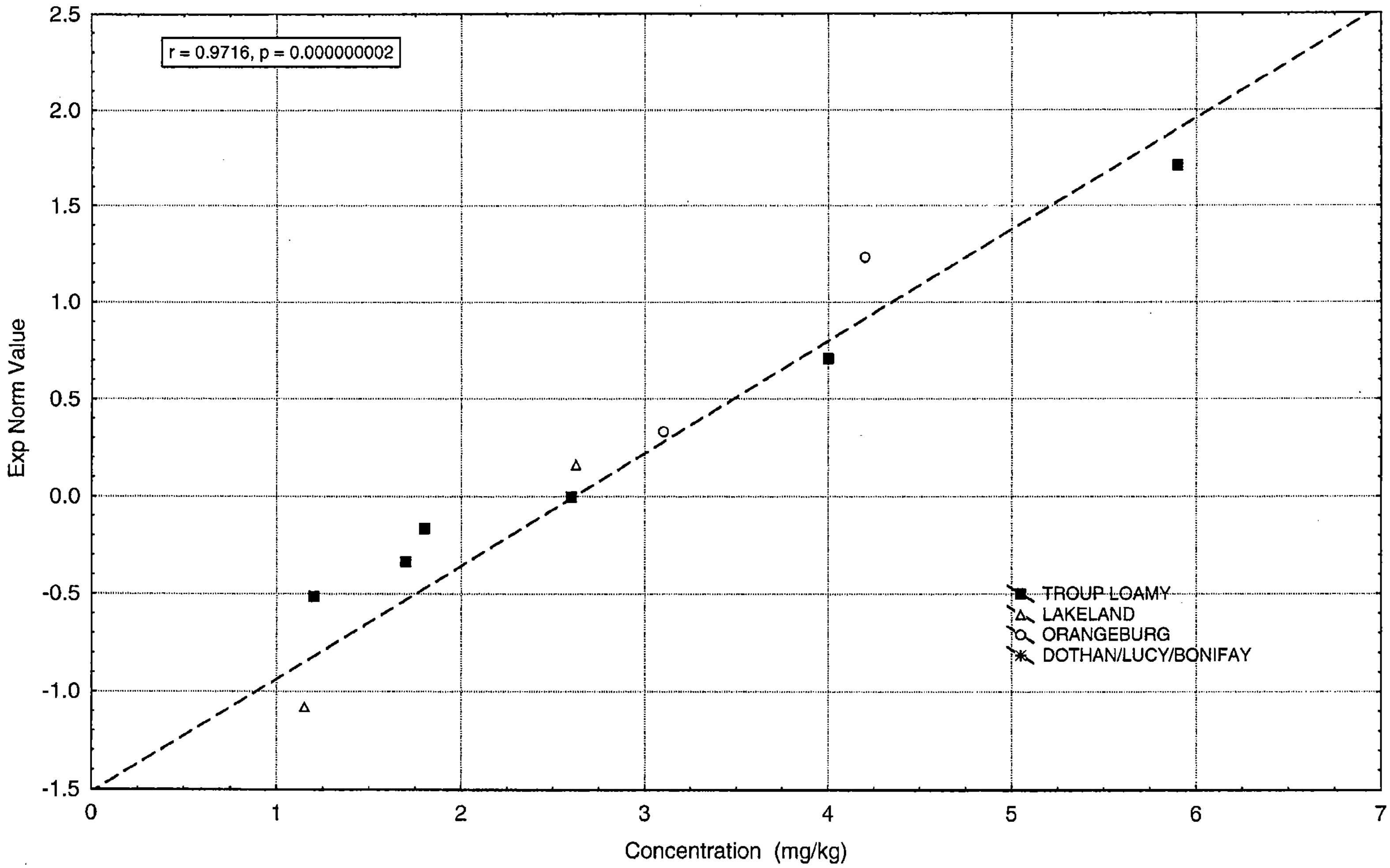
APPENDIX FIGURE A-11-15
NORMAL PROBABILITY PLOT - MANGANESE - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



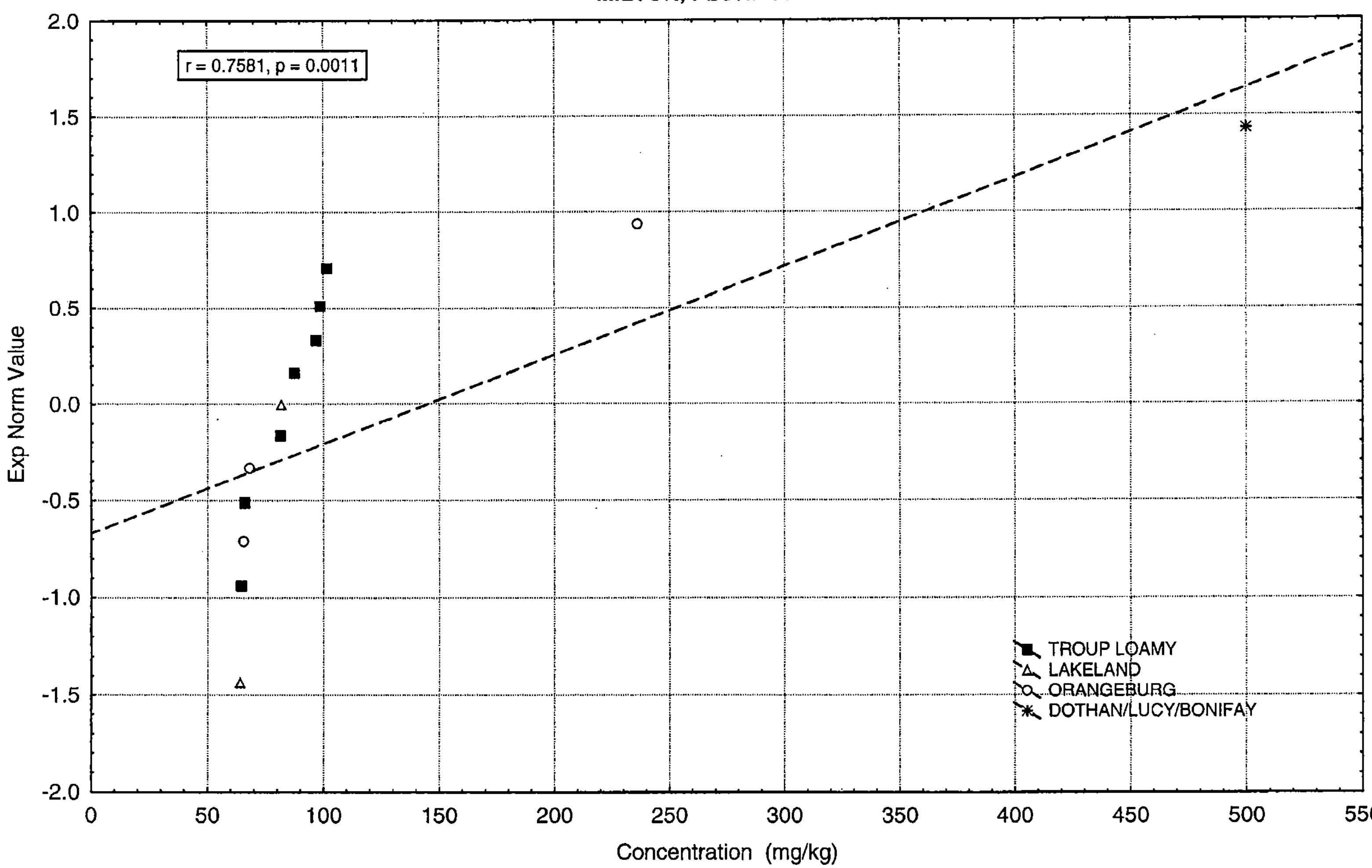
APPENDIX FIGURE A-11-16
NORMAL PROBABILITY PLOT - MERCURY - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



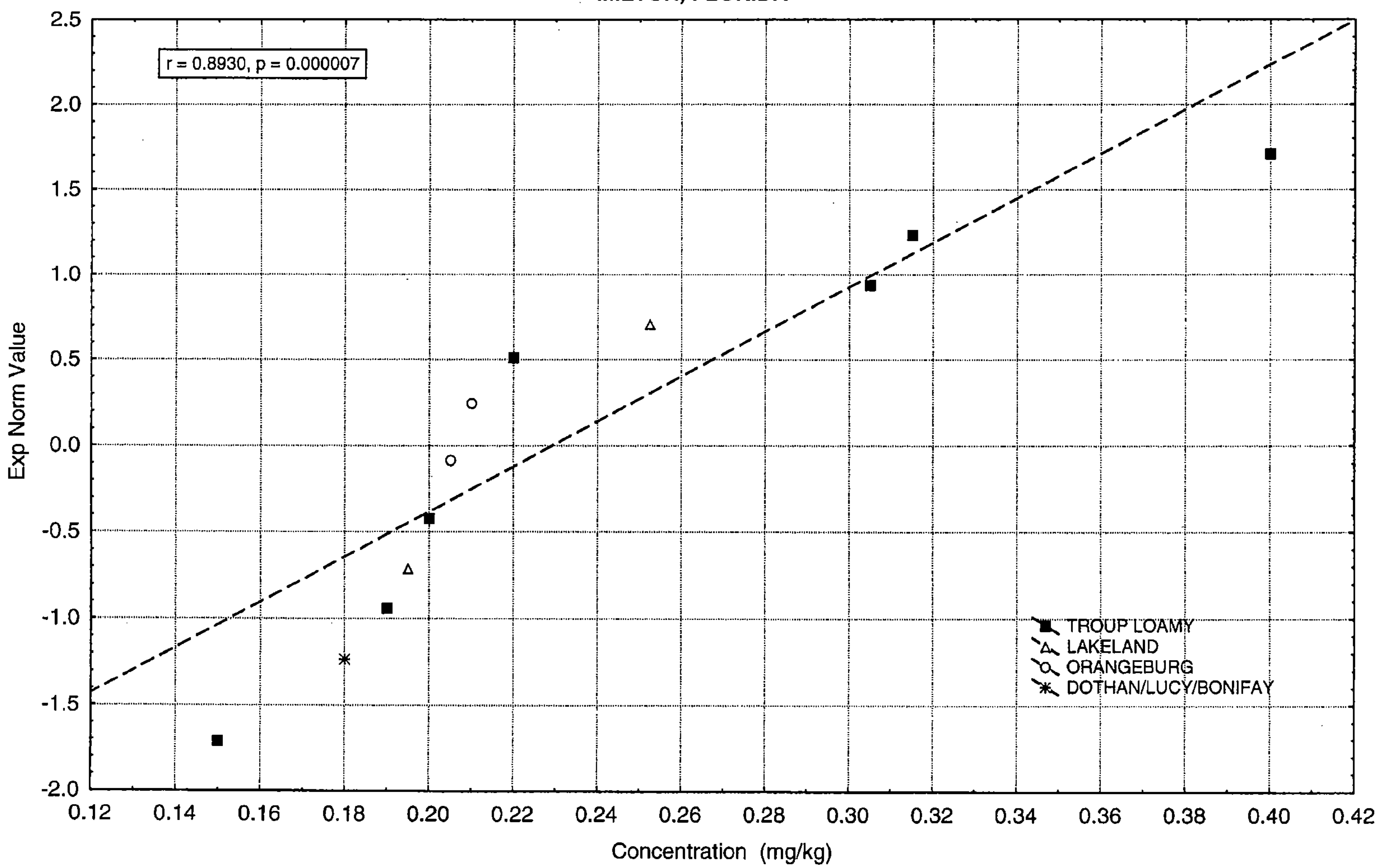
APPENDIX FIGURE A-11-17
NORMAL PROBABILITY PLOT - NICKEL - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



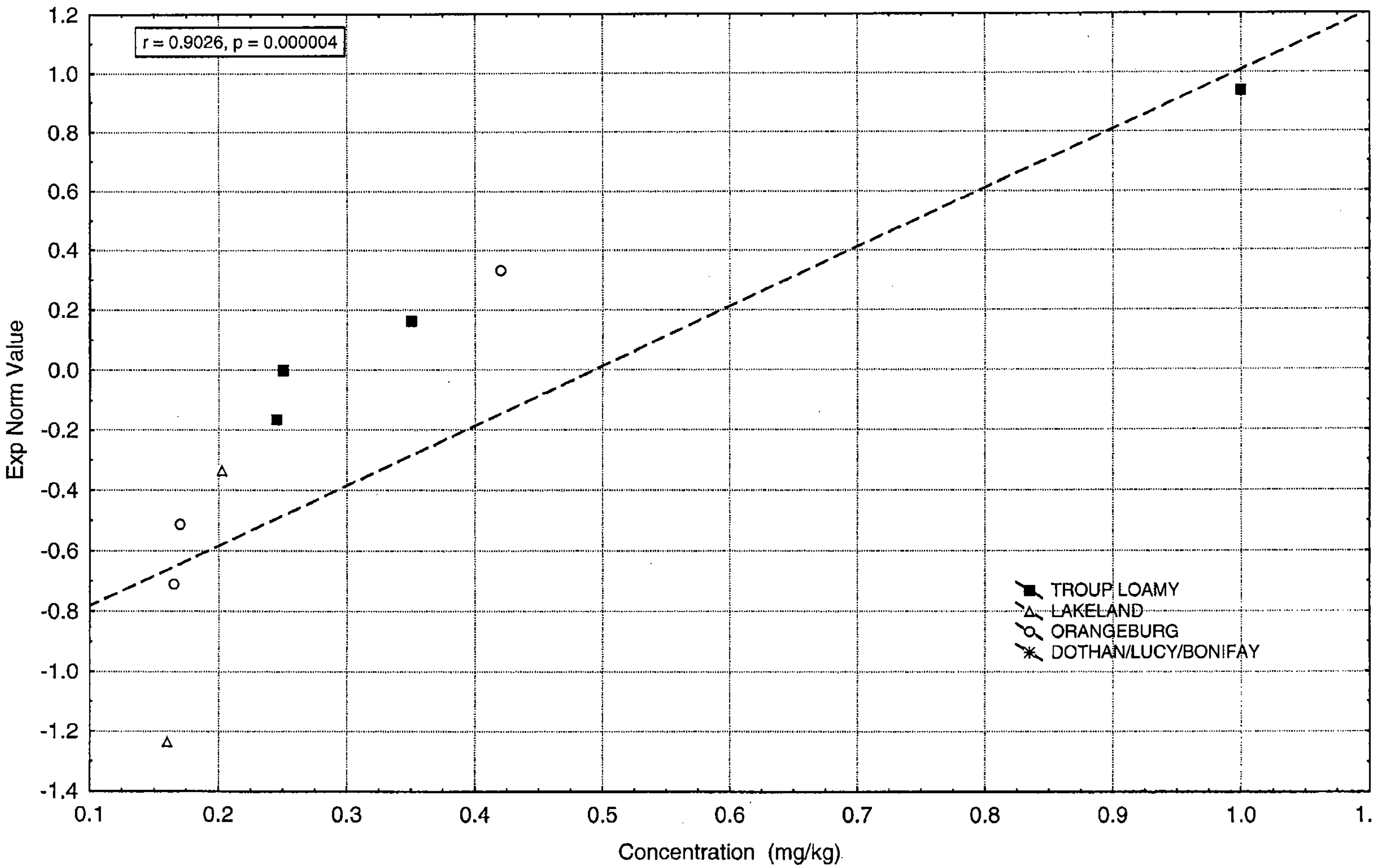
APPENDIX FIGURE A-11-18
NORMAL PROBABILITY PLOT - POTASSIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



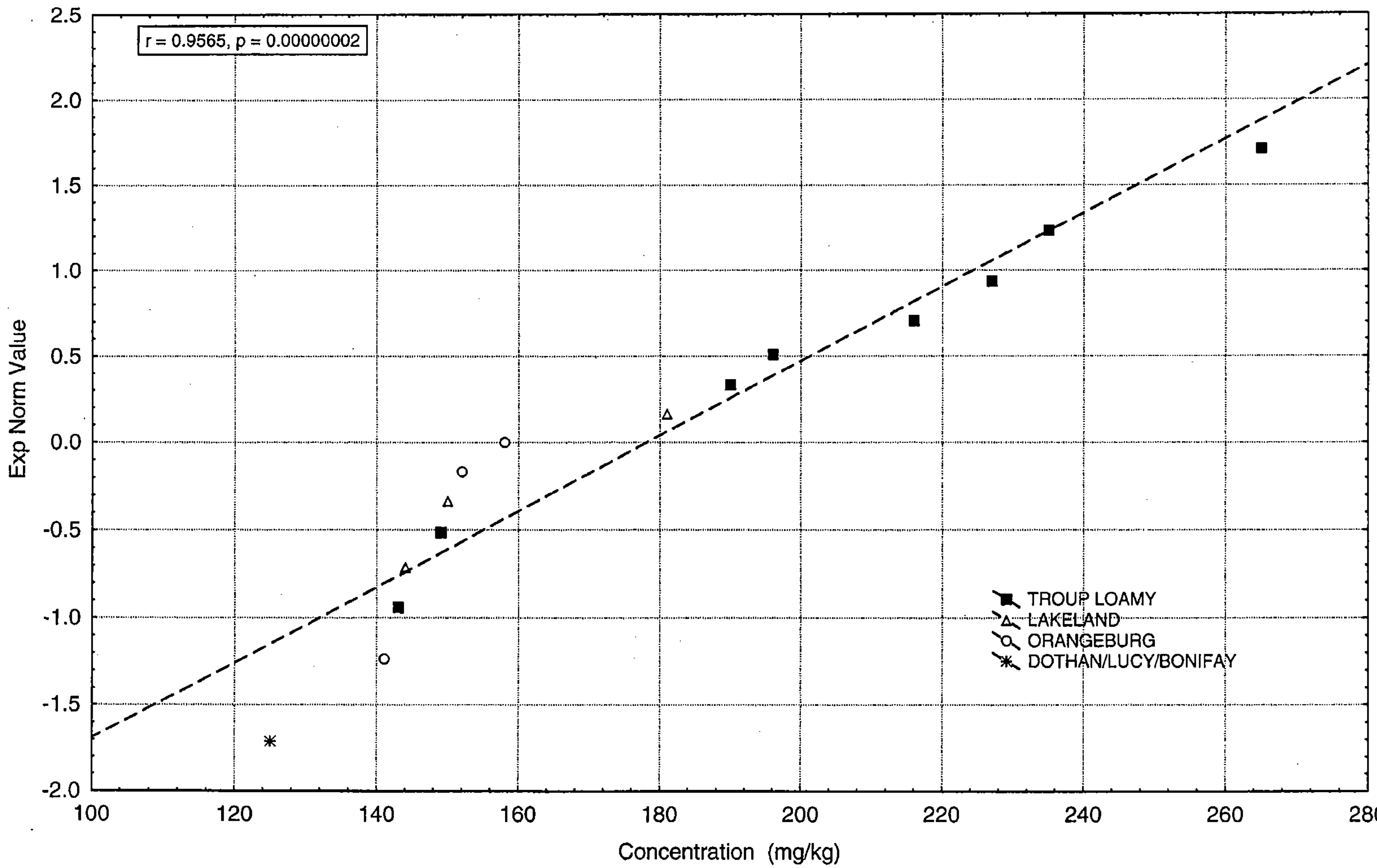
APPENDIX FIGURE A-11-19
NORMAL PROBABILITY PLOT - SELENIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



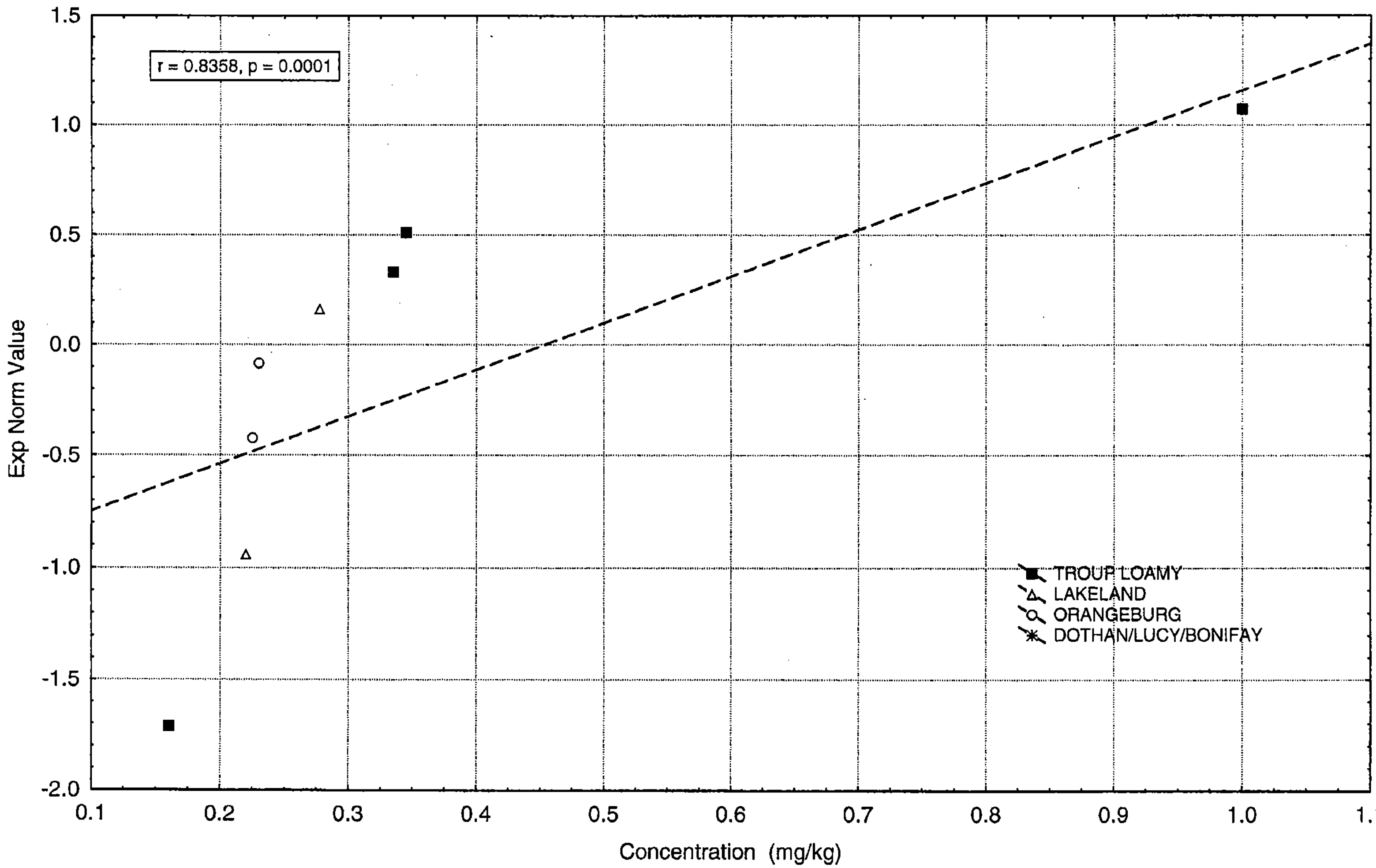
APPENDIX FIGURE A-11-20
NORMAL PROBABILITY PLOT - SILVER - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



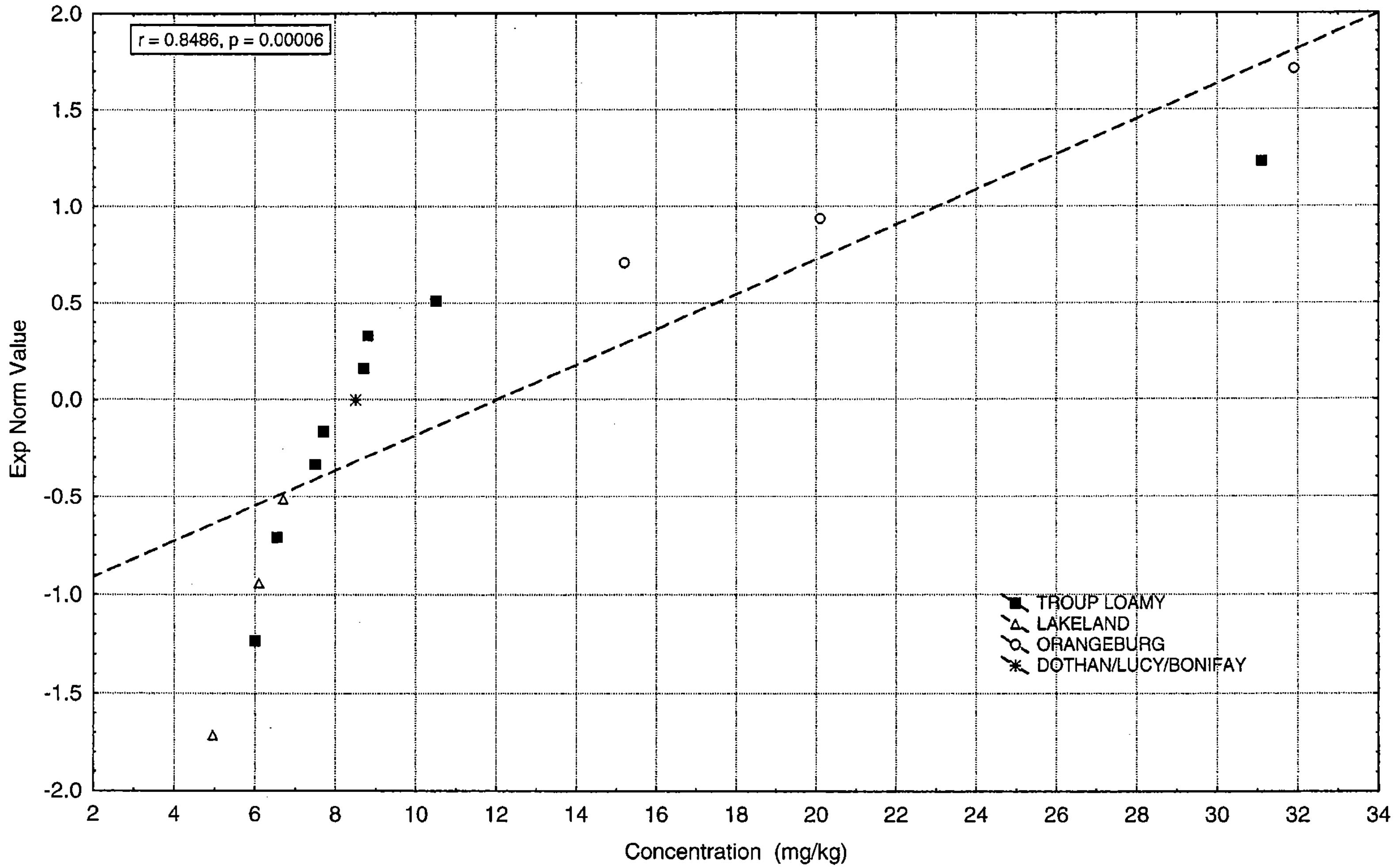
APPENDIX FIGURE A-11-21
NORMAL PROBABILITY PLOT - SODIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



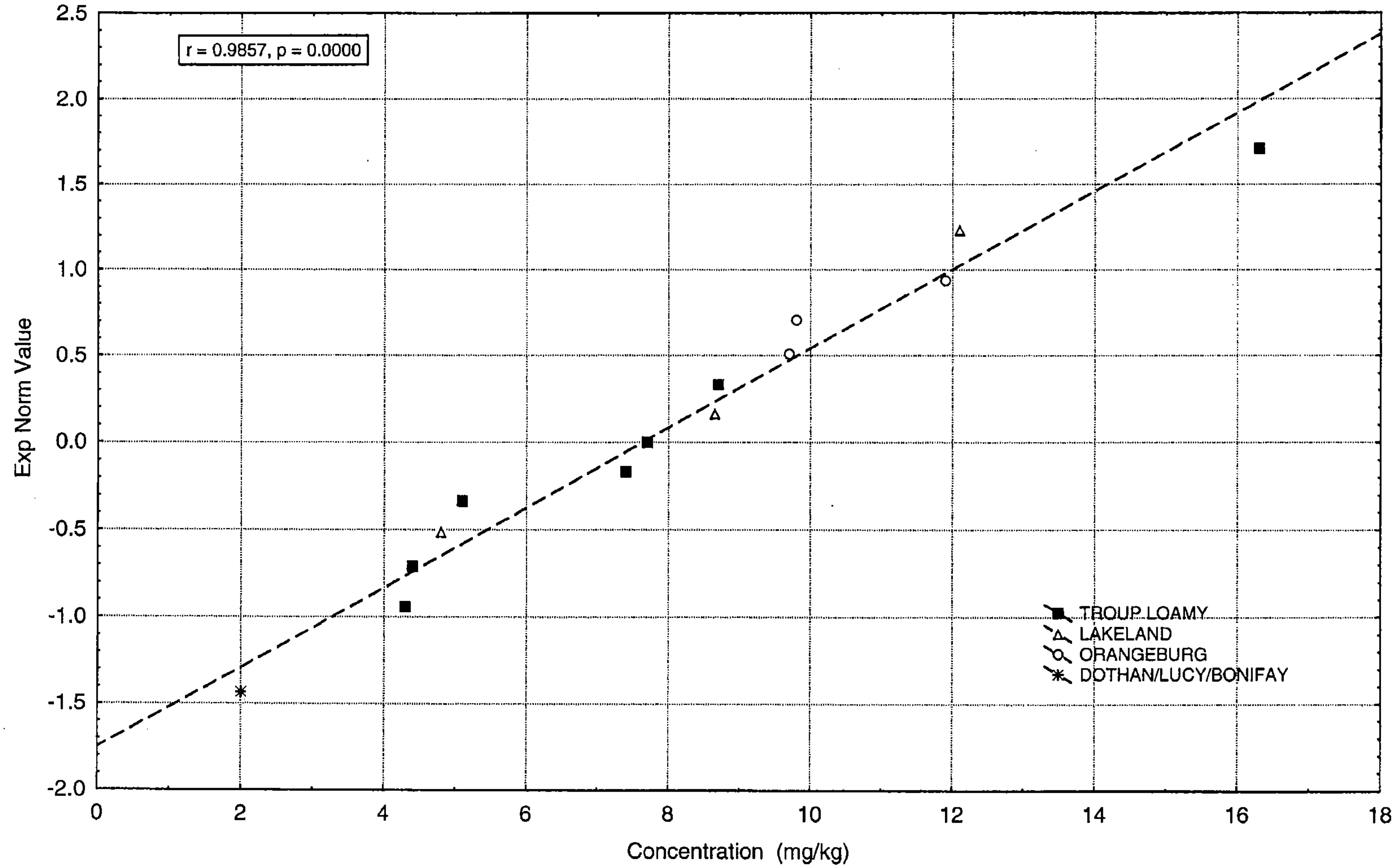
APPENDIX FIGURE A-11-22
NORMAL PROBABILITY PLOT - THALLIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-11-23
NORMAL PROBABILITY PLOT - VANADIUM - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX FIGURE A-11-24
NORMAL PROBABILITY PLOT - ZINC - SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
FACILITY BACKGROUND SURFACE SOIL DATASET
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA



APPENDIX A.12

SUMMARY OF ANALYTIC RESULTS – FILL SAMPLE

APPENDIX TABLE A-12-1
SUMMARY OF ANALYTIC RESULTS - FILL SAMPLE
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
NAVAL AIR STATION, WHTING FIELD
MILTON, FLORIDA

SITE	0006, 0016, 0038
LOCATION	BARROW_PIT
NSAMPLE	011FILLMAT01
SAMPLE	011FILLMAT01
SUBMATRIX	SO
SACODE	NORMAL
DEPTH RANGE	---
STATUS	NORMAL
SAMPLE DATE	3/4/2002
COLLECTION METHOD	GRAB
Volatile Organics (ug/kg)	
1,1,1-TRICHLOROETHANE	2.2 U
1,1,2,2-TETRACHLOROETHANE	2.2 U
1,1,2-TRICHLOROETHANE	2.2 U
1,1-DICHLOROETHANE	2.2 U
1,1-DICHLOROETHENE	2.2 U
1,2-DICHLOROETHANE	2.2 U
1,2-DICHLOROPROPANE	2.2 U
1,3-DICHLOROPROPANE	2.2 U
2-BUTANONE	4.4 U
2-HEXANONE	4.4 U
4-METHYL-2-PENTANONE	4.4 U
ACETONE	4.9 U
BENZENE	2.2 U
BENZYL CHLORIDE	2.2 U
BROMODICHLOROMETHANE	2.2 U
BROMOFORM	2.2 U
BROMOMETHANE	2.2 U
CARBON DISULFIDE	2.2 U
CARBON TETRACHLORIDE	2.2 U
CHLOROBENZENE	2.2 U
CHLORODIBROMOMETHANE	2.2 U
CHLOROETHANE	2.2 U
CHLOROFORM	2.2 U
CHLOROMETHANE	2.2 U
CIS-1,2-DICHLOROETHENE	2.2 U
CIS-1,3-DICHLOROPROPENE	2.2 U
ETHYLBENZENE	2.2 U
M+P-XYLENES	4.4 U
METHYLENE CHLORIDE	2.2 U
O-XYLENE	2.2 U
STYRENE	2.2 U
TETRACHLOROETHENE	2.2 U
TOLUENE	2.2 U
TOTAL 1,2-DICHLOROETHENE	4.4 U
TOTAL XYLENES	6.6 U
TRANS-1,2-DICHLOROETHENE	2.2 U
TRANS-1,3-DICHLOROPROPENE	2.2 U
TRICHLOROETHENE	2.2 U
VINYL ACETATE	2.2 U
VINYL CHLORIDE	2.2 U
Semivolatile Organics (ug/kg)	
1,2,4-TRICHLOROBENZENE	363 U
1,2-DICHLOROBENZENE	363 U
1,3-DICHLOROBENZENE	363 U
1,4-DICHLOROBENZENE	363 U
1-METHYLNAPHTHALENE	363 U
2,4,5-TRICHLOROPHENOL	363 U
2,4,6-TRICHLOROPHENOL	363 U
2,4-DICHLOROPHENOL	363 U
2,4-DIMETHYLPHENOL	363 U
2,4-DINITROPHENOL	726 U
2,4-DINITROTOLUENE	363 U
2,6-DINITROTOLUENE	363 U
2-CHLORONAPHTHALENE	363 U
2-CHLOROPHENOL	363 U
2-METHYLNAPHTHALENE	363 U
2-METHYLPHENOL	363 U
2-NITROANILINE	363 U
2-NITROPHENOL	363 U
3,3'-DICHLOROBENZIDINE	363 U

SITE	**0006, 0016, 0038**
LOCATION	**BARROW_PIT**
NSAMPLE	**011FILLMAT01**
SAMPLE	**011FILLMAT01**
SUBMATRIX	**SO**
SACODE	**NORMAL**
DEPTH RANGE	**---**
STATUS	**NORMAL**
SAMPLE DATE	**3/4/2002**
COLLECTION METHOD	**GRAB**
3-NITROANILINE	363 U
4,6-DINITRO-2-METHYLPHENOL	726 U
4-BROMOPHENYL PHENYL ETHER	363 U
4-CHLORO-3-METHYLPHENOL	363 U
4-CHLOROANILINE	363 U
4-CHLOROPHENYL PHENYL ETHER	363 U
4-METHYLPHENOL	363 U
4-NITROANILINE	363 U
4-NITROPHENOL	726 U
ACENAPHTHENE	363 U
ACENAPHTHYLENE	363 U
ANTHRACENE	363 U
BENZO(A)ANTHRACENE	363 U
BENZO(A)PYRENE	182 U
BENZO(B)FLUORANTHENE	363 U
BENZO(G,H,I)PERYLENE	363 U
BENZO(K)FLUORANTHENE	363 U
BENZOIC ACID	363 U
BENZYL ALCOHOL	526 U
BIS(2-CHLOROETHOXY)METHANE	363 U
BIS(2-CHLOROETHYL)ETHER	363 U
BIS(2-CHLOROISOPROPYL)ETHER	363 U
BIS(2-ETHYLHEXYL)PHTHALATE	363 U
BUTYL BENZYL PHTHALATE	363 U
CARBAZOLE	363 U
CHRYSENE	363 U
DI-N-BUTYL PHTHALATE	363 U
DI-N-OCTYL PHTHALATE	363 U
DIBENZO(A,H)ANTHRACENE	182 U
DIBENZOFURAN	363 U
DIETHYL PHTHALATE	363 U
DIMETHYL PHTHALATE	363 U
FLUORANTHENE	363 U
FLUORENE	363 U
HEXACHLOROBENZENE	363 U
HEXACHLOROBUTADIENE	363 U
HEXACHLOROCYCLOPENTADIENE	363 U
HEXACHLOROETHANE	363 U
INDENO(1,2,3-CD)PYRENE	363 U
ISOPHORONE	363 U
N-NITROSO-DI-N-PROPYLAMINE	163 U
N-NITROSODIPHENYLAMINE	363 U
NAPHTHALENE	363 U
NITROBENZENE	363 U
PENTACHLOROPHENOL	363 U
PHENANTHRENE	363 U
PHENOL	363 U
PYRENE	363 U
Pesticides PCBs (ug/kg)	
4,4'-DDD	1.6 U
4,4'-DDE	1.6 U
4,4'-DDT	1.6 U
ALDRIN	1.6 U
ALPHA-BHC	1.6 U
ALPHA-CHLORDANE	1.6 U
AROCLOR-1016	16 U
AROCLOR-1221	36 U
AROCLOR-1232	36 U
AROCLOR-1242	36 U
AROCLOR-1248	36 U
AROCLOR-1254	74 U

APPENDIX TABLE A-12-1
SUMMARY OF ANALYTIC RESULTS - FILL SAMPLE
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
NAVAL AIR STATION, WHTING FIELD
MILTON, FLORIDA

SITE	**0006, 0016, 0038**
LOCATION	**BARROW_PIT**
NSAMPLE	**011FILLMAT01**
SAMPLE	**011FILLMAT01**
SUBMATRIX	**SO**
SACODE	**NORMAL**
DEPTH RANGE	**—**
STATUS	**NORMAL**
SAMPLE DATE	**3/4/2002**
COLLECTION METHOD	**GRAB**
AROCLOR-1260	25 U
BETA-BHC	1.6 U
DELTA-BHC	1.6 U
DIELDRIN	1.6 U
ENDOSULFAN I	1.6 U
ENDOSULFAN II	1.6 U
ENDOSULFAN SULFATE	1.6 U
ENDRIN	1.6 U
ENDRIN ALDEHYDE	1.6 U
ENDRIN KETONE	1.6 U
GAMMA-BHC (LINDANE)	1.6 U
GAMMA-CHLORDANE	1.6 U
HEPTACHLOR	1.6 U
HEPTACHLOR EPOXIDE	1.6 U
METHOXYCHLOR	1.6 U
TOXAPHENE	91 U
Herbicides (ug/kg)	
2,4,5-T	8.4 U
2,4,5-TP (SILVEX)	8.4 U
2,4-D	8.4 U
2,4-DB	8.4 U
DALAPON	9 U
DICAMBA	8.4 U
DICHLOROPROP	8.4 U
DINOSEB	8.4 U
MCPA	1530 JP
MCPP	1100 U
Inorganics (mg/kg)	
ALUMINUM	8510
ANTIMONY	0.21 U
ARSENIC	2.2
BARIUM	9.8 J
BERYLLIUM	0.094 J
CADMIUM	0.033 U
CALCIUM	68.1 J
CHROMIUM	7.7
COBALT	0.66 J
COPPER	3.4 J
IRON	7610
LEAD	3.1
MAGNESIUM	122 J
MANGANESE	32
MERCURY	0.012 J
NICKEL	1.7 J
POTASSIUM	440 J
SELENIUM	0.26 U
SILVER	0.044 U
SODIUM	20.9 U
THALLIUM	0.34 U
VANADIUM	16
ZINC	5.3
Petroleum Hydrocarbons (mg/kg)	
TOTAL PETROLEUM HYDROCARBONS	13.2

APPENDIX TABLE A-12-2
SUMMARY OF CHEMICALS DETECTED - FILL SAMPLE
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION REPORT
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

SITE	**0006, 0016, 0038**
LOCATION	**BARROW_PIT**
NSAMPLE	**011FILLMAT01**
SAMPLE	**011FILLMAT01**
SUBMATRIX	**SO**
SACODE	**NORMAL**
DEPTH RANGE	**—**
STATUS	**NORMAL**
SAMPLE DATE	**3/4/2002**
COLLECTION METHOD	**GRAB**
Herbicides (ug/kg)	
MCPA	1530 JP
Inorganics (mg/kg)	
ALUMINUM	8510
ARSENIC	2.2
BARIUM	9.8 J
BERYLLIUM	0.094 J
CALCIUM	68.1 J
CHROMIUM	7.7
COBALT	0.66 J
COPPER	3.4 J
IRON	7610
LEAD	3.1
MAGNESIUM	122 J
MANGANESE	32
MERCURY	0.012 J
NICKEL	1.7 J
POTASSIUM	440 J
VANADIUM	16
ZINC	5.3
Petroleum Hydrocarbons (mg/kg)	
TOTAL PETROLEUM HYDROCARBONS	13.2

APPENDIX B

SUPPORTING INFORMATION FOR HUMAN HEALTH RISK ASSESSMENT

APPENDIX B.1

ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLs)

TABLE 1
ALTERNATE SOIL CLEANUP LEVELS
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CHEMICAL	CONSTRUCTION WORKERS		MAINTENANCE WORKERS		ADOLESCENT RECREATIONAL USERS		ADULT RECREATIONAL USERS		LIFELONG RECREATIONAL USERS	
	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)
1,2,4-TRICHLOROBENZENE	--	48	--	2000	--	3600	--	4300	--	--
1,4-DICHLOROBENZENE	45	2500	76	110000	280	78000	180	110000	110	--
1-METHYLNAPHTHALENE	--	--	--	--	--	--	--	--	--	--
2-BUTANONE	--	13000	--	820000	--	750000	--	950000	--	--
2-HEXANONE	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE	--	500	--	17000	--	12000	--	18000	--	--
4,4'-DDD	80	--	140	--	82	--	74	--	39	--
4,4'-DDE	57	--	99	--	58	--	52	--	27	--
4,4'-DDT	57	140	100	6000	58	1400	52	2500	27	--
4-METHYL-2-PENTANONE	--	5800	--	470000	--	480000	--	560000	--	--
4-METHYLPHENOL	--	620	--	22000	--	8500	--	17000	--	--
ACENAPHTHENE	--	8200	--	280000	--	190000	--	280000	--	--
ACENAPHTHENE	--	8200	--	280000	--	190000	--	280000	--	--
ACENAPHTHYLENE	--	--	--	--	--	--	--	--	--	--
ACETONE	--	12000	--	520000	--	800000	--	990000	--	--
ALDRIN	0.93	6.8	1.2	210	0.76	55	0.83	120	0.4	--
ALPHA-CHLORDANE	44	98	30	1100	37	920	40	2000	19	--
ALUMINUM	--	12000	--	13000000	--	3500000	--	5400000	--	--
ANTHRACENE	--	68000	--	3500000	--	1000000	--	1600000	--	--
ANTIMONY	--	120	--	6800	--	1500	--	2300	--	--
AROCLOR-1242	4.9	--	8.3	--	5.1	--	5.8	--	2.7	--
AROCLOR-1254	5.5	4.4	2.7	120	5.2	31	6	73	2.8	--
AROCLOR-1260	5.3	--	2.7	--	5.2	--	5.9	--	2.8	--
ARSENIC	11	83	23	3700	13	850	12	1500	6.2	--
BARIUM	--	1600	--	1000000	--	250000	--	390000	--	--
BENZO(A)ANTHRACENE	21	--	24	--	15	--	18	--	8.2	--
BENZO(A)PYRENE	2.1	--	2.4	--	1.5	--	1.8	--	0.83	--
BENZO(B)FLUORANTHENE	20	--	23	--	15	--	18	--	8.2	--
BENZO(G,H,I)PERYLENE	--	--	--	--	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	210	--	240	--	150	--	180	--	83	--
BERYLLIUM	100	64	18000	31000	79000	7200	46000	11000	29000	--
BIS(2-CHLOROETHOXY)METHANE	--	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	1200	4700	1500	150000	920	37000	1000	81000	480	--
BUTYL BENZYL PHTHALATE	--	46000	--	1400000	--	370000	--	810000	--	--
CADMIUM	140	120	23000	5600	100000	1300	61000	2400	39000	--
CARBON DISULFIDE	--	270	--	11000	--	21000	--	25000	--	--
CHLOROBENZENE	--	120	--	5000	--	8700	--	11000	--	--
CHROMIUM	21	270	3600	50000	16000	11000	9400	17000	5900	--
CHRYSENE	2000	--	2300	--	1500	--	1800	--	820	--
COBALT	89	70	15000	160000	67000	64000	39000	96000	25000	--

TABLE 1
ALTERNATE SOIL CLEANUP LEVELS
NAVAL AIR STATION, WHITING FIELD
MILTON FLORIDA

CHEMICAL	CONSTRUCTION WORKERS		MAINTENANCE WORKERS		ADOLESCENT RECREATIONAL USERS		ADULT RECREATIONAL USERS		LIFELONG RECREATIONAL USERS	
	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)	CANCER (mg/kg)	NONCANCER (mg/kg)
COPPER	--	12000	--	680000	--	150000	--	230000	--	--
CYANIDE	--	4700	--	66000	--	37000	--	81000	--	--
DIBENZO(A,H)ANTHRACENE	2.1	--	2.4	--	1.5	--	1.8	--	0.83	--
DIBENZOFURAN	--	230	--	27000	--	5900	--	8700	--	--
DIELDRIN	0.93	11	1.2	340	0.8	91	0.87	200	0.42	--
DIETHYL PHTHALATE	--	140000	--	4800000	--	1400000	--	3100000	--	--
DIMETHYL PHTHALATE	--	1200000	--	49000000	--	17000000	--	35000000	--	--
DI-N-BUTYL PHTHALATE	--	23000	--	670000	--	180000	--	400000	--	--
ETHYLBENZENE	--	1700	--	72000	--	100000	--	130000	--	--
FLUORANTHENE	--	8200	--	240000	--	64000	--	150000	--	--
FLUORENE	--	8000	--	400000	--	140000	--	210000	--	--
GAMMA-CHLORDANE	44	98	30	1067	37	900	40	2000	19	--
HEPTACHLOR	3.3	110	4.2	3400	2.8	910	3.1	2000	1.5	--
HEPTACHLOR EPOXIDE	1.7	2.9	2.2	93	1.4	24	1.5	52	0.74	--
INDENO(1,2,3-CD)PYRENE	21	--	24	--	15	--	18	--	8.3	--
IRON	--	91000	--	5100000	--	1100000	--	1700000	--	--
MANGANESE	--	170	--	230000	--	69000	--	110000	--	--
MERCURY	--	93	--	5100	--	1100	--	1700	--	--
METHYLENE CHLORIDE	120	2200	200	93000	770	100000	470	140000	290	--
NAPHTHALENE	--	57	--	2400	--	4400	--	5200	--	--
NICKEL	--	6000	--	340000	--	73000	--	110000	--	--
PHENANTHRENE	--	--	--	--	--	--	--	--	--	--
PHENOL	--	33000	--	1200000	--	500000	--	1000000	--	--
PYRENE	--	8500	--	470000	--	110000	--	170000	--	--
SELENIUM	--	1500	--	85000	--	18000	--	28000	--	--
SILVER	--	1500	--	85000	--	18000	--	28000	--	--
THALLIUM	--	21	--	1200	--	260	--	400	--	--
TOLUENE	--	520	--	21000	--	40000	--	47000	--	--
TOTAL XYLENES	--	230	--	5700	--	19000	--	22000	--	--
TRICHLOROETHENE	43	22	71	920	310	1700	190	2000	120	--
TOTAL PETROLEUM HYDROCARBONS	--	490	--	21000	--	31000	--	40000	--	--
VANADIUM	--	300	--	17000	--	3600	--	5700	--	--
ZINC	--	91000	--	5100000	--	1100000	--	1700000	--	--

APPENDIX B.2

EXAMPLE CALCULATIONS OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLs)

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS CONSTRUCTION WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for consturction workers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{TR \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = CSFo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = CSFd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = CSFi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
TR	=	1.0E-06	Target Cancer Risk (unitless)
BW	=	70	Body weight (kg)
AT	=	25550	Averaging time (days)
EF	=	250	Exposure frequency (days/year)
ED	=	1	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	330	Ingestion rate, oral (mg/day)
SA	=	3300	Surface area of skin exposed (cm^2/day)
AF	=	0.3	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	20	Inhalation rate (m^3/day)
VF	=	6.74E+05	Volatilization factor (m^3/kg)
PEF	=	2.43E+06	Particulate emission factor (m^3/kg)
CSFo	=	3.50E-01	Oral cancer slope factor $(mg/kg/day)^{-1}$
CSFd	=	3.50E-01	Dermal cancer slope factor $(mg/kg/day)^{-1}$
CSFi	=	3.50E-01	Inhalation cancer slope factor $(mg/kg/day)^{-1}$

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS CONSTRUCTION WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 3.50E-01 (mg/kg-day)-1 x 330 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 1.16E-04 kg-kg/mg

$Intake_{Der}$ = 3.50E-01 (mg/kg-day)-1 x 3300 cm2/day x 0.3 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 3.47E-05 kg-kg/mg

$Intake_{Inh}$ = 3.50E-01 (mg/kg-day)-1 x 20 m3/day x (1/6.74E+05 m3/kg + 1/2.43E+06 m3/kg)

$Intake_{Inh}$ = 1.33E-05 kg-kg/mg

$$SCTL = \frac{1.E\text{-}06 \times 70\ kg \times 25550\ days}{250\ days/yr \times 1\ yrs \times 1 \times [1.16E\text{-}04\ kg\text{-}kg/mg + 3.47E\text{-}05\ kg\text{-}kg/mg + 1.33E\text{-}05\ kg\text{-}kg/mg]}$$

SCTL = 4.38E+01 mg/kg

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - CONSTRUCTION WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for consturction workers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{THI \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = 1/RfDo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = 1/RfDd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = 1/RfDi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
THI	=	1	Target Hazard Index (unitless)
BW	=	70	Body weight (kg)
AT	=	365	Averaging time (days)
EF	=	250	Exposure frequency (days/year)
ED	=	1	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	330	Ingestion rate, oral (mg/day)
SA	=	3300	Surface area of skin exposed (cm^2/day)
AF	=	0.3	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	20	Inhalation rate (m^3/day)
VF	=	6.74E+05	Volatilization factor (m^3/kg)
PEF	=	2.43E+06	Particulate emission factor (m^3/kg)
RfDo	=	5.0E-04	Oral reference dose (mg/kg/day)
RfDd	=	5.0E-04	Dermal reference dose (mg/kg/day)
RfDi	=	2.0E-04	Inhalation reference dose (mg/kg/day)

CLIENT: NAVAL AIR STATION, WHITING FIELD		JOB NUMBER: 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - CONSTRUCTION WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	CHECKED BY: T. Jackson	DATE: 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 1/5.0E-04 mg/kg-day x 330 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 6.60E-01 kg-kg/mg ✓

$Intake_{Der}$ = 1/5.0E-04 mg/kg-day x 3300 cm2/day x 0.3 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 1.98E-01 kg-kg/mg ✓

$Intake_{Inh}$ = 1/2.0E-04 mg/kg-day x 20 m3/day x (1/6.74E+05 m3/kg + 1/2.43E+06 m3/kg)

$Intake_{Inh}$ = 1.90E-01 kg-kg/mg ✓

$$SCTL = \frac{1 \text{ x } 70 \text{ kg x } 365 \text{ days}}{250 \text{ days/yr x } 1 \text{ yrs x } 1 \text{ x } [6.60E\text{-}01 \text{ kg-kg/mg} + 1.98E\text{-}01 \text{ kg-kg/mg} + 1.90E\text{-}01 \text{ kg-kg/mg}]}$$

SCTL = 9.76E+01 mg/kg ✓

CALCULATION WORKSHEET

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS MAINTENANCE WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:**	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for maintenance workers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{TR \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = CSFo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = CSFd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = CSFi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
TR	=	1.0E-06	Target Cancer Risk (unitless)
BW	=	70	Body weight (kg)
AT	=	25550	Averaging time (days)
EF	=	30	Exposure frequency (days/year)
ED	=	25	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	50	Ingestion rate, oral (mg/day)
SA	=	3300	Surface area of skin exposed (cm^2/day)
AF	=	0.2	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	20	Inhalation rate (m^3/day)
VF	=	1.77E+05	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
CSFo	=	3.50E-01	Oral cancer slope factor $(mg/kg/day)^{-1}$
CSFd	=	3.50E-01	Dermal cancer slope factor $(mg/kg/day)^{-1}$
CSFi	=	3.50E-01	Inhalation cancer slope factor $(mg/kg/day)^{-1}$

CLIENT: NAVAL AIR STATION, WHITING FIELD	**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS MAINTENANCE WORKERS	
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999	

BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 3.50E-01 (mg/kg-day)-1 x 50 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 1.75E-05 kg-kg/mg

$Intake_{Der}$ = 3.50E-01 (mg/kg-day)-1 x 3300 cm2/day x 0.2 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 2.31E-05 kg-kg/mg

$Intake_{Inh}$ = 3.50E-01 (mg/kg-day)-1 x 20 m3/day x (1/1.77E+05 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 3.96E-05 kg-kg/mg

$$SCTL = \frac{1.E\text{-}06 \times 70 \text{ kg} \times 25550 \text{ days}}{30 \text{ days/yr} \times 25 \text{ yrs} \times 1 \times [1.75E\text{-}05 \text{ kg-kg/mg} + 2.31E\text{-}05 \text{ kg-kg/mg} + 3.96E\text{-}05 \text{ kg-kg/mg}]}$$

SCTL = 2.97E+01 mg/kg

CLIENT: NAVAL AIR STATION, WHITING FIELD		JOB NUMBER: 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - MAINTENANCE WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	~~CHECKED~~ BY: T. Jackson	DATE: 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for maintenance workers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{THI \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = 1/RfDo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = 1/RfDd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = 1/RfDi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
THI	=	1	Target Hazard Index (unitless)
BW	=	70	Body weight (kg)
AT	=	9125	Averaging time (days)
EF	=	30	Exposure frequency (days/year)
ED	=	25	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	50	Ingestion rate, oral (mg/day)
SA	=	3300	Surface area of skin exposed (cm^2/day)
AF	=	0.2	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	20	Inhalation rate (m^3/day)
VF	=	1.77E+05	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
RfDo	=	5.0E-04	Oral reference dose (mg/kg/day)
RfDd	=	5.0E-04	Dermal reference dose (mg/kg/day)
RfDi	=	2.0E-04	Inhalation reference dose (mg/kg/day)

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - MAINTENANCE WORKERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jodson	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 1/5.0E-04 mg/kg-day x 50 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 1.00E-01 kg-kg/mg

$Intake_{Der}$ = 1/5.0E-04 mg/kg-day x 3300 cm2/day x 0.2 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 1.32E-01 kg-kg/mg

$Intake_{Inh}$ = 1/2.0E-04 mg/kg-day x 20 m3/day x (1/1.77E+05 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 5.66E-01 kg-kg/mg

$$SCTL = \frac{1 \text{ x } 70 \text{ kg x } 9125 \text{ days}}{30 \text{ days/yr x } 25 \text{ yrs x } 1 \text{ x } [1.00\text{E-01 kg-kg/mg} + 1.32\text{E-01 kg-kg/mg} + 5.66\text{E-01 kg-kg/mg}]}$$

SCTL = 1.07E+03 mg/kg

CALCULATION WORKSHEET

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS ADOLESCENT TRESPASSERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for adolescent trespassers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{TR \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = CSFo \times IRo \times 10^{-6} \text{ kg/mg}$$

$$Intake_{Der} = CSFd \times SA \times AF \times DA \times 10^{-6} \text{ kg/mg}$$

$$Intake_{Inh} = CSFi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
TR	=	1.0E-06	Target Cancer Risk (unitless)
BW	=	45	Body weight (kg)
AT	=	25550	Averaging time (days)
EF	=	45	Exposure frequency (days/year)
ED	=	10	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	100	Ingestion rate, oral (mg/day)
SA	=	3280	Surface area of skin exposed (cm^2/day)
AF	=	0.3	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	4.8	Inhalation rate (m^3/day)
VF	=	3.69E+06	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
CSFo	=	3.50E-01	Oral cancer slope factor $(mg/kg/day)^{-1}$
CSFd	=	3.50E-01	Dermal cancer slope factor $(mg/kg/day)^{-1}$
CSFi	=	3.50E-01	Inhalation cancer slope factor $(mg/kg/day)^{-1}$

CALCULATION WORKSHEET

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS ADOLESCENT TRESPASSERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 3.50E-01 (mg/kg-day)-1 x 100 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 3.50E-05 kg-kg/mg

$Intake_{Der}$ = 3.50E-01 (mg/kg-day)-1 x 3280 cm2/day x 0.3 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 3.44E-05 kg-kg/mg

$Intake_{Inh}$ = 3.50E-01 (mg/kg-day)-1 x 4.8 m3/day x (1/3.69E+06 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 4.57E-07 kg-kg/mg

$$SCTL = \frac{1.E\text{-}06 \times 45\ kg \times 25550\ days}{45\ days/yr \times 10\ yrs \times 1 \times [3.50E\text{-}05\ kg\text{-}kg/mg + 3.44E\text{-}05\ kg\text{-}kg/mg + 4.57E\text{-}07\ kg\text{-}kg/mg]}$$

SCTL = 3.66E+01 mg/kg

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - ADOLESCENT TRESPASERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for adolescent trespassers exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{THI \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = 1/RfDo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = 1/RfDd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = 1/RfDi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
THI	=	1	Target Hazard Index (unitless)
BW	=	45	Body weight (kg)
AT	=	3650	Averaging time (days)
EF	=	45	Exposure frequency (days/year)
ED	=	10	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	100	Ingestion rate, oral (mg/day)
SA	=	3280	Surface area of skin exposed (cm^2/day)
AF	=	0.3	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	4.8	Inhalation rate (m^3/day)
VF	=	3.69E+06	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
RfDo	=	5.0E-04	Oral reference dose (mg/kg/day)
RfDd	=	5.0E-04	Dermal reference dose (mg/kg/day)
RfDi	=	2.0E-04	Inhalation reference dose (mg/kg/day)

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - ADOLESCENT TRESPASERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jupin	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 1/5.0E-04 mg/kg-day x 100 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 2.00E-01 kg-kg/mg

$Intake_{Der}$ = 1/5.0E-04 mg/kg-day x 3280 cm2/day x 0.3 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 1.97E-01 kg-kg/mg

$Intake_{Inh}$ = 1/2.0E-04 mg/kg-day x 4.8 m3/day x (1/3.69E+06 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 6.52E-03 kg-kg/mg

$$SCTL = \frac{1 \times 45 \text{ kg} \times 3650 \text{ days}}{45 \text{ days/yr} \times 10 \text{ yrs} \times 1 \times [2.00E\text{-}01 \text{ kg-kg/mg} + 1.97E\text{-}01 \text{ kg-kg/mg} + 6.52E\text{-}03 \text{ kg-kg/mg}]}$$

SCTL = 9.05E+02 mg/kg

CLIENT: NAVAL AIR STATION, WHITING FIELD	**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS ADULT RECREATIONAL USERS	
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999	

BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for adult recreational users exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{TR \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = CSFo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = CSFd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = CSFi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
TR	=	1.0E-06	Target Cancer Risk (unitless)
BW	=	70	Body weight (kg)
AT	=	25550	Averaging time (days)
EF	=	45	Exposure frequency (days/year)
ED	=	20	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	100	Ingestion rate, oral (mg/day)
SA	=	5700	Surface area of skin exposed (cm^2/day)
AF	=	0.07	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	6.4	Inhalation rate (m^3/day)
VF	=	3.69E+06	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
CSFo	=	3.50E-01	Oral cancer slope factor $(mg/kg/day)^{-1}$
CSFd	=	3.50E-01	Dermal cancer slope factor $(mg/kg/day)^{-1}$
CSFi	=	3.50E-01	Inhalation cancer slope factor $(mg/kg/day)^{-1}$

CALCULATION WORKSHEET

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR CARCINOGENS ADULT RECREATIONAL USERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 3.50E-01 (mg/kg-day)-1 x 100 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 3.50E-05 kg-kg/mg ✓

$Intake_{Der}$ = 3.50E-01 (mg/kg-day)-1 x 5700 cm2/day x 0.07 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 1.40E-05 kg-kg/mg ✓

$Intake_{Inh}$ = 3.50E-01 (mg/kg-day)-1 x 6.4 m3/day x (1/3.69E+06 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 6.09E-07 kg-kg/mg ✓

$$SCTL = \frac{1.E\text{-}06 \times 70 \text{ kg} \times 25550 \text{ days}}{45 \text{ days/yr} \times 20 \text{ yrs} \times 1 \times [3.50E\text{-}05 \text{ kg-kg/mg} + 1.40E\text{-}05 \text{ kg-kg/mg} + 6.09E\text{-}07 \text{ kg-kg/mg}]}$$

SCTL = 4.01E+01 mg/kg ✓

CLIENT: NAVAL AIR STATION, WHITING FIELD		**JOB NUMBER:** 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - ADULT RECREATIONAL USERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** 09/15/2004

PURPOSE: To calculate an alternative soil cleanup level for adult recreational users exposed to soil.

RELEVANT EQUATIONS:

$$SCTL = \frac{THI \times BW \times AT}{EF \times ED \times FC \times [Intake_{Ing} + Intake_{Der} + Intake_{Inh}]}$$

$$Intake_{Ing} = 1/RfDo \times IRo \times 10^{-6}\ kg/mg$$

$$Intake_{Der} = 1/RfDd \times SA \times AF \times DA \times 10^{-6}\ kg/mg$$

$$Intake_{Inh} = 1/RfDi \times IRi \times (1/VF + 1/PEF)$$

Where:

Chemical	=	Chlordane	
SCTL	=		Soil Cleanup Target Level (mg/kg)
THI	=	1	Target Hazard Index (unitless)
BW	=	70	Body weight (kg)
AT	=	7300	Averaging time (days)
EF	=	45	Exposure frequency (days/year)
ED	=	20	Exposure duration (years)
FC	=	1	Fraction from contaminated source (unitless)
IRo	=	100	Ingestion rate, oral (mg/day)
SA	=	5700	Surface area of skin exposed (cm^2/day)
AF	=	0.07	Adherence factor (mg/cm^2)
DA	=	0.1	Dermal absorption (unitless)
IRi	=	6.4	Inhalation rate (m^3/day)
VF	=	3.69E+06	Volatilization factor (m^3/kg)
PEF	=	1.24E+09	Particulate emission factor (m^3/kg)
RfDo	=	5.0E-04	Oral reference dose (mg/kg/day)
RfDd	=	5.0E-04	Dermal reference dose (mg/kg/day)
RfDi	=	2.0E-04	Inhalation reference dose (mg/kg/day)

CLIENT: NAVAL AIR STATION, WHITING FIELD		JOB NUMBER: 0052
SUBJECT: CALCULATION OF ALTERNATE SOIL CLEANUP TARGET LEVELS (SCTLS) FOR NONCARCINOGENS - ADULT RECREATIONAL USERS		
BASED ON: TECHNICAL REPORT: DEVELOPMENT OF SOIL CLEANUP TARGET LEVELS FOR CHAPTER 62-777, F.A.C., FDEP, AUGUST 1999		
BY: R. JUPIN	CHECKED BY: T Jackson	DATE: 09/15/2004

EXAMPLE CALCULATION

$Intake_{Ing}$ = 1/5.0E-04 mg/kg-day x 100 mg/day x 1E-06 kg/mg

$Intake_{Ing}$ = 2.00E-01 kg-kg/mg

$Intake_{Der}$ = 1/5.0E-04 mg/kg-day x 5700 cm2/day x 0.07 mg/cm2 x 0.1 x 1E-06 kg/mg

$Intake_{Der}$ = 7.98E-02 kg-kg/mg

$Intake_{Inh}$ = 1/2.0E-04 mg/kg-day x 6.4 m3/day x (1/3.69E+06 m3/kg + 1/1.24E+09 m3/kg)

$Intake_{Inh}$ = 8.70E-03 kg-kg/mg

$$SCTL = \frac{1 \text{ x } 70 \text{ kg x } 7300 \text{ days}}{45 \text{ days/yr x } 20 \text{ yrs x } 1 \text{ x } [2.00E\text{-}01 \text{ kg-kg/mg} + 7.98E\text{-}02 \text{ kg-kg/mg} + 8.70E\text{-}03 \text{ kg-kg/mg}]}$$

SCTL = 1.97E+03 mg/kg

APPENDIX B.3

HUMAN HEALTH RISK CHARACTERIZATION RESULTS

SITE 9, WASTE FUEL DISPOSAL PIT

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	26	0.3
		Total ILCR	NA		Total HI	0.3

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	240	0.03
		Total ILCR	NA		Total HI	0.03

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	120	0.07
		Total ILCR	NA		Total HI	0.07

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	6800	0.001
		Total ILCR	NA		Total HI	0.001

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	1500	0.006
		Total ILCR	NA		Total HI	0.006

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	8.3	NA	NA	Blood, Mortality	2300	0.004
		Total ILCR	NA		Total HI	0.004

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 9, WASTE FUEL DISPOSAL PIT
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	8.3	480	NA			
		Total ILCR	NA		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF).

SITE 10, SOUTHEAST OPEN DISPOSAL AREA A

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	76	1.0E-08	Liver	1200	0.0007
Benzo(a)pyrene Equivalents	2.31	0.1	2.3E-05	NA	NA	NA
Aroclor-1254	0.363	0.5	7.3E-07	Immunological	1.1	0.3
Aroclor-1260	0.060	0.5	1.2E-07	NA	NA	NA
Dieldrin	0.019	0.07	2.7E-07	Liver	2.9	0.007
Barium	57.0	NA	NA	Cardiovascular	5200	0.01
Chromium	23.2	290	8.0E-08	Respiratory	210	0.1
		Total ILCR	2E-05		Total HI	0.5

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	330	2.4E-09	Liver	280	0.003
Benzo(a)pyrene Equivalents	2.31	0.5	4.6E-06	NA	NA	NA
Aroclor-1254	0.363	2.1	1.7E-07	Immunological	9.4	0.04
Aroclor-1260	0.060	2.1	2.9E-08	NA	NA	NA
Dieldrin	0.019	0.3	6.3E-08	Liver	29	0.0007
Barium	57.0	NA	NA	Cardiovascular	87000	0.0007
Chromium	23.2	420	5.5E-08	Respiratory	5900	0.004
		Total ILCR	5E-06		Total HI	0.05

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	1200	6.6E-10	Liver	4700	0.0002
Benzo(a)pyrene Equivalents	2.31	2.1	1.1E-06	NA	NA	NA
Aroclor-1254	0.363	5.5	6.6E-08	Immunological	4.4	0.08
Aroclor-1260	0.060	5.3	1.1E-08	NA	NA	NA
Dieldrin	0.019	0.93	2.0E-08	Liver	11	0.002
Barium	57.0	NA	NA	Cardiovascular	1600	0.04
Chromium	23.2	21	1.1E-06	Respiratory	270	0.09
		Total ILCR	2E-06		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	1500	5.3E-10	Liver	150000	0.000005
Benzo(a)pyrene Equivalents	2.31	2.4	9.6E-07	NA	NA	NA
Aroclor-1254	0.363	2.7	1.3E-07	Immunological	120	0.003
Aroclor-1260	0.060	2.7	2.2E-08	NA	NA	NA
Dieldrin	0.019	1.2	1.6E-08	Liver	340	0.00006
Barium	57.0	NA	NA	Cardiovascular	1000000	0.00006
Chromium	23.2	3600	6.4E-09	Respiratory	50000	0.0005
		Total ILCR	1E-06		Total HI	0.004

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	920	8.6E-10	Liver	37000	0.00002
Benzo(a)pyrene Equivalents	2.31	1.5	1.5E-06	NA	NA	NA
Aroclor-1254	0.363	5.2	7.0E-08	Immunological	31	0.01
Aroclor-1260	0.060	5.2	1.2E-08	NA	NA	NA
Dieldrin	0.019	0.8	2.4E-08	Liver	91	0.0002
Barium	57.0	NA	NA	Cardiovascular	250000	0.0002
Chromium	23.2	16000	1.5E-09	Respiratory	11000	0.002
		Total ILCR	2E-06		Total HI	0.01

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	1000	7.9E-10	Liver	81000	0.00001
Benzo(a)pyrene Equivalents	2.31	1.8	1.3E-06	NA	NA	NA
Aroclor-1254	0.363	6.0	6.1E-08	Immunological	73	0.005
Aroclor-1260	0.060	5.9	1.0E-08	NA	NA	NA
Dieldrin	0.019	0.87	2.2E-08	Liver	200	0.0001
Barium	57.0	NA	NA	Cardiovascular	390000	0.0001
Chromium	23.2	9400	2.5E-09	Respiratory	17000	0.001
		Total ILCR	1E-06		Total HI	0.007

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Bis(2-ethylhexyl)phthalate	0.790	480	1.6E-09			
Benzo(a)pyrene Equivalents	2.31	0.83	2.8E-06			
Aroclor-1254	0.363	2.8	1.3E-07			
Aroclor-1260	0.060	2.8	2.1E-08			
Dieldrin	0.019	0.42	4.5E-08			
Barium	57.0	NA	NA			
Chromium	23.2	5900	3.9E-09			
		Total ILCR	3E-06		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF).

TABLE 8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Aldrin	0.0039	0.07	5.6E-08	Liver	1.8	0.002
Dieldrin	0.005	0.07	7.1E-08	Liver	2.9	0.002
Antimony	7.9	NA	NA	Blood, Mortality	26	0.3
Chromium	207	290	7.1E-07	Respiratory	210	1.0
		Total ILCR	8E-07		Total HI	1

1 - SCTLs were calculated as per the methodology presented in Appenix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Aldrin	0.0039	0.3	1.3E-08	Liver	18	0.0002
Dieldrin	0.005	0.3	1.7E-08	Liver	29	0.0002
Antimony	7.9	NA	NA	Blood, Mortality	240	0.03
Chromium	207	420	4.9E-07	Respiratory	5900	0.04
		Total ILCR	5E-07		Total HI	0.07

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 10, SOUTHEAST OPEN DISPOSAL AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Aldrin	0.0039	0.93	4.2E-09	Liver	6.8	0.0006
Dieldrin	0.005	0.93	5.4E-09	Liver	11	0.0005
Antimony	7.9	NA	NA	Blood, Mortality	120	0.07
Chromium	207	21	9.9E-06	Respiratory	270	0.8
		Total ILCR	1E-05		Total HI	0.8

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

SITE 11, SOUTHEAST OPEN DISPOSAL AREA B

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	0.1	4.3E-07	NA	NA	NA
4,4'-DDT	0.265	3.3	8.0E-08	Liver	36	0.007
Alpha-Chlordane	0.184	3.1	5.9E-08	Liver	31	0.006
Dieldrin	0.126	0.07	1.8E-06	Liver	2.9	0.04
Gamma-Chlordane	0.191	3.1	6.2E-08	Liver	31	0.006
Heptachlor	0.079	0.2	4.0E-07	Liver	29	0.003
Heptachlor-Epoxide	0.063	0.1	6.3E-07	Liver	0.78	0.08
		Total ILCR	3E-06		Total HI	0.1

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	0.5	8.6E-08	NA	NA	NA
4,4'-DDT	0.265	13	2.0E-08	Liver	590	0.0004
Alpha-Chlordane	0.184	12	1.5E-08	Liver	300	NA
Dieldrin	0.126	0.3	4.2E-07	Liver	29	0.004
Gamma-Chlordane	0.191	12	1.6E-08	Liver	300	0.0006
Heptachlor	0.079	0.9	8.8E-08	Liver	290	0.0003
Heptachlor-Epoxide	0.063	0.4	1.6E-07	Liver	7.7	0.008
		Total ILCR	8E-07		Total HI	0.01

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	2.1	2.0E-08	NA	NA	NA
4,4'-DDT	0.265	57	4.6E-09	Liver	140	0.002
Alpha-Chlordane	0.184	44	4.2E-09	Liver	98	0.002
Dieldrin	0.126	0.93	1.4E-07	Liver	11	0.01
Gamma-Chlordane	0.191	44	4.3E-09	Liver	98	0.002
Heptachlor	0.079	3.3	2.4E-08	Liver	110	0.0007
Heptachlor-Epoxide	0.063	1.7	3.7E-08	Liver	2.9	0.02
		Total ILCR	2E-07		Total HI	0.04

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	2.4	1.8E-08	NA	NA	NA
4,4'-DDT	0.265	100	2.7E-09	Liver	6000	0.00004
Alpha-Chlordane	0.184	30	6.1E-09	Liver	1100	0.0002
Dieldrin	0.126	1.2	1.1E-07	Liver	340	0.0004
Gamma-Chlordane	0.191	30	6.4E-09	Liver	1100	0.0002
Heptachlor	0.079	4.2	1.9E-08	Liver	3400	0.00002
Heptachlor-Epoxide	0.063	2.2	2.9E-08	Liver	93	0.0007
		Total ILCR	2E-07		Total HI	0.001

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	1.5	2.9E-08	NA	NA	NA
4,4'-DDT	0.265	58	4.6E-09	Liver	1400	0.0002
Alpha-Chlordane	0.184	37	5.0E-09	Liver	920	0.0002
Dieldrin	0.126	0.8	1.6E-07	Liver	91	0.001
Gamma-Chlordane	0.191	37	5.2E-09	Liver	920	0.0002
Heptachlor	0.079	2.8	2.8E-08	Liver	910	0.00009
Heptachlor-Epoxide	0.063	1.4	4.5E-08	Liver	24	0.003
		Total ILCR	3E-07		Total HI	0.005

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	1.8	2.4E-08	NA	NA	NA
4,4'-DDT	0.265	52	5.1E-09	Liver	2500	0.0001
Alpha-Chlordane	0.184	40	4.6E-09	Liver	2000	0.0001
Dieldrin	0.126	0.87	1.4E-07	Liver	200	0.0006
Gamma-Chlordane	0.191	40	4.8E-09	Liver	2000	0.00010
Heptachlor	0.079	3.1	2.5E-08	Liver	2000	0.00004
Heptachlor-Epoxide	0.063	1.5	4.2E-08	Liver	52	0.001
		Total ILCR	3E-07		Total HI	0.002

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.043	0.83	5.2E-08			
4,4'-DDT	0.265	27	9.8E-09			
Alpha-Chlordane	0.184	19	9.7E-09			
Dieldrin	0.126	0.42	3.0E-07			
Gamma-Chlordane	0.191	19	1.0E-08			
Heptachlor	0.079	1.5	5.3E-08			
Heptachlor-Epoxide	0.063	0.74	8.5E-08			
		Total ILCR	5E-07		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.

TABLE 8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Aldrin	0.007	0.07	1.0E-07	Liver	1.8	0.004
Aroclor-1254	0.26	0.5	5.2E-07	Immunological	1.1	0.2
Aroclor-1260	0.062	0.5	1.2E-07	NA	NA	NA
Dieldrin	0.033	0.07	4.7E-07	Liver	2.9	0.01
Cadmium	6.5	1900	3.4E-09	Kidney	75	0.09
		Total ILCR	1E-06		Total HI	0.3

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Aldrin	0.007	0.3	2.3E-08	Liver	18	0.0004
Aroclor-1254	0.26	2.1	1.2E-07	Immunological	9.4	0.03
Aroclor-1260	0.062	2.1	3.0E-08	NA	NA	NA
Dieldrin	0.033	0.3	1.1E-07	Liver	29	0.001
Cadmium	6.5	2800	2.3E-09	Kidney	1300	0.005
		Total ILCR	3E-07		Total HI	0.03

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

TABLE 10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Aldrin	0.007	0.93	7.5E-09	Liver	6.8	0.001
Aroclor-1254	0.26	5.5	4.7E-08	Immunological	4.4	0.06
Aroclor-1260	0.062	5.3	1.2E-08	NA	NA	NA
Dieldrin	0.033	0.93	3.5E-08	Liver	11	0.003
Cadmium	6.5	140	4.6E-08	Kidney	120	0.05
		Total ILCR	1E-07		Total HI	0.1

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no reference doses (RfD) available for this chemical.

LEAD MODELING RESULTS

Calculations of Preliminary Remediation Goals (PRGs)

SITE NAME: NAVAL AIR STATION, WHITING FIELD, MILTON FLORIDA
LOCATION: SITE 11, SOUTHEAST OPEN DISPOSAL AREA B - SURFACE SOIL
RECEPTOR: CONSTRUCTION WORKER/TYPICAL OCCUPATIONAL WORKER
DATE: SEPTEMBER 17, 2004

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 Construction Worker	Using Equation 1 Occupational Worker	Using Equation 2 Construction Worker	Using Equation 2 Occupational Worker
PbS	X	X	Soil lead concentration	ug/g or ppm	93.1	93.1	93.1	93.1
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.200	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.200	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	**ug/dL**	**1.9**	**1.5**	**1.9**	**1.5**
$PbB_{fetal, 0.95}$			**95th percentile PbB among fetuses of adult workers**	**ug/dL**	**5.7**	**4.5**	**5.7**	**4.5**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**0.8%**	**0.3%**	**0.8%**	**0.3%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

LEAD MODEL FOR WINDOWS Version 1.0

==

Model Version: 1.0 Build 261
Location: Naval Air Station, Whiting Field, Milton, Florida
Site Name: Site 11
Date: 9/17/2004
Run Mode: Site Risk Assessment

Soil/Dust Data
Average concentration of lead in surface soil = 93.1 mg/kg.

==

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

==
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 2 of 3)
Site Name: Site 11
Date: 9/17/2004
Run Mode: Site Risk Assessment

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 75.170 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	93.100	75.170
1-2	93.100	75.170
2-3	93.100	75.170
3-4	93.100	75.170
4-5	93.100	75.170
5-6	93.100	75.170
6-7	93.100	75.170

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

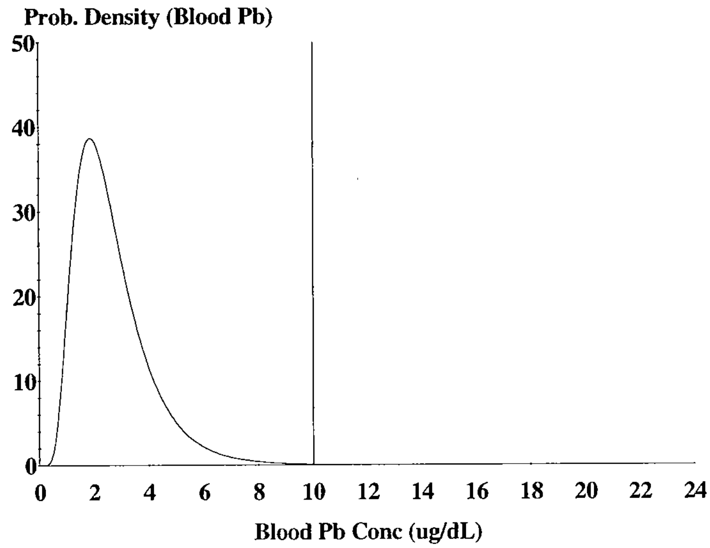
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.612	0.000	0.378
1-2	0.034	2.722	0.000	0.942
2-3	0.062	3.075	0.000	0.985
3-4	0.067	2.980	0.000	1.013
4-5	0.067	2.902	0.000	1.062
5-6	0.093	3.074	0.000	1.125
6-7	0.093	3.399	0.000	1.146

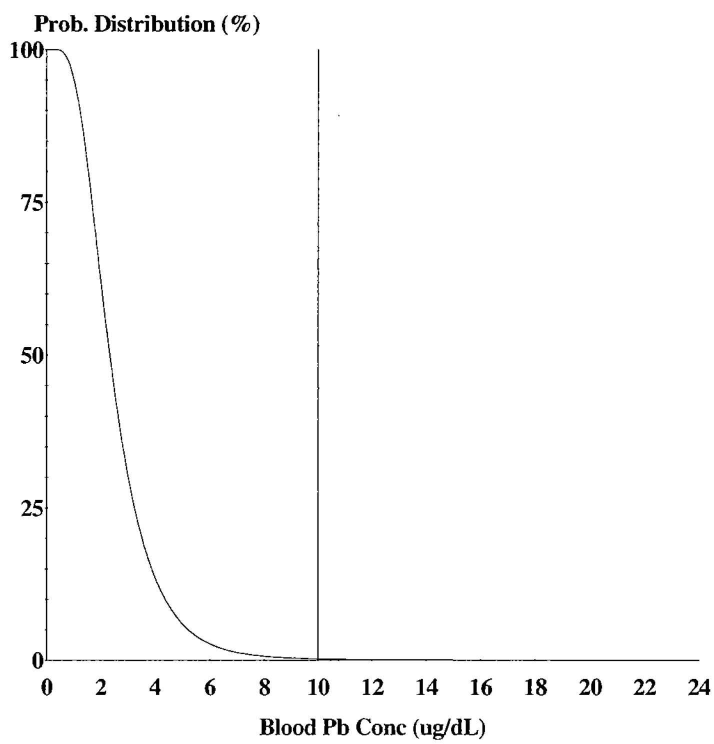
Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	2.005	5.017	2.7
1-2	3.175	6.873	2.9
2-3	3.194	7.316	2.7
3-4	3.220	7.280	2.6
4-5	2.412	6.443	2.2
5-6	2.179	6.471	2.0
6-7	2.061	6.699	1.9

==
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 3 of 3)
Site Name: Site 11
Date: 9/17/2004
Run Mode: Site Risk Assessment



Cutoff = 10.000 ug/dl
Geo Mean = 2.446
GSD = 1.600
% Above = 0.137
% Below = 99.863

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Surface Soil (93.1 mg/kg)



Cutoff = 10.000 ug/dl
Geo Mean = 2.446
GSD = 1.600
% Above = 0.137

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Surface Soil (93.1 mg/kg)

SITE 12, TETRAETHYL LEAD DISPOSAL AREA

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Dieldrin	0.013	0.07	1.9E-07	Liver	2.9	0.004
		Total ILCR	2E-07		Total HI	0.004

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Dieldrin	0.013	0.3	4.3E-08	Liver	29	0.0004
		Total ILCR	4E-08		Total HI	0.0004

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Dieldrin	0.013	0.93	1.4E-08	Liver	11	0.001
		Total ILCR	1E-08		Total HI	0.001

1 - SCTLs were calculated as per the methodology presented in Appendix B.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Dieldrin	0.013	1.2	1.1E-08	Liver	340	0.00004
		Total ILCR	1E-08		Total HI	0.00004

1 - SCTLs were calculated as per the methodology presented in Appendix B.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Dieldrin	0.013	0.8	1.6E-08	Liver	91	0.0001
		Total ILCR	2E-08		Total HI	0.0001

1 - SCTLs were calculated as per the methodology presented in Appendix B.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Dieldrin	0.013	0.87	1.5E-08	Liver	200	0.00007
		Total ILCR	1E-08		Total HI	0.00007

1 - SCTLs were calculated as per the methodology presented in Appendix B.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 12, TETRAETHYL LEAD DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Dieldrin	0.013	0.42	3.1E-08			
		Total ILCR	3E-08		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.

SITE 13, SANITARY LANDFILL

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Mercury	4.2	NA	NA	Neurological	3.4	1
		Total ILCR	NA		Total HI	1

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Mercury	4.2	NA	NA	Neurological	26	0.2
		Total ILCR	NA		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 13, SANITARY LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Mercury	4.2	NA	NA	Neurological	1100	0.004
		Total ILCR	NA		Total HI	0.004

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

SITE 15, SOUTHWEST LANDFILL

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	**SCTL[1] (mg/kg)**	**Estimated ILCR**	**Primary Target Organs**	**SCTL[1] (mg/kg)**	**Estimated HQ**
Aroclor-1254	2.2	0.5	4.4E-06	Immunological	1.1	2
Mercury	0.59	NA	NA	Neurological	3.4	0.2
		Total ILCR	4E-06		Total HI	2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Aroclor-1254	2.2	2.1	1.0E-06	Immunological	9.4	0.2
Mercury	0.59	NA	NA	Neurological	26	0.02
		Total ILCR	1E-06		Total HI	0.3

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 15, SOUTHWEST LANDFILL
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Aroclor-1254	2.2	5.5	4.0E-07	Immunological	4.4	0.5
Mercury	0.59	NA	NA	Neurological	1100	0.0005
		Total ILCR	4E-07		Total HI	0.5

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

SITE 16, OPEN DISPOSAL AND BURNING AREA

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	0.1	4.1E-06	NA	NA	NA
Aroclor-1254	0.057	0.5	1.1E-07	Immunological	1.1	0.05
Aroclor-1260	0.051	0.5	1.0E-07	NA	NA	NA
Dieldrin	0.013	0.07	1.9E-07	Liver	2.9	0.004
Antimony	5.90	NA	NA	Blood, Mortality	26	0.2
Barium	67.1	NA	NA	Cardiovascular	5200	0.01
Cadmium	1.9	1900	1.0E-09	Kidney	75	0.03
Chromium	15.2	290	5.2E-08	Respiratory	210	0.07
Copper	51.1	NA	NA	Gastrointestinal	5500	0.009
Mercury	0.156	NA	NA	Neurological	3.4	0.05
		Total ILCR	5E-06		Total HI	0.4

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	0.5	8.2E-07	NA	NA	NA
Aroclor-1254	0.057	2.1	2.7E-08	Immunological	9.4	0.006
Aroclor-1260	0.051	2.1	2.4E-08	NA	NA	NA
Dieldrin	0.013	0.3	4.3E-08	Liver	29	0.0004
Antimony	5.899	NA	NA	Blood, Mortality	240	0.02
Barium	67.1	NA	NA	Cardiovascular	87000	0.0008
Cadmium	1.9	2800	6.8E-10	Kidney	1300	0.001
Chromium	15.2	420	3.6E-08	Respiratory	5900	0.003
Copper	51.1	NA	NA	Gastrointestinal	76000	0.0007
Mercury	0.2	NA	NA	Neurological	26	0.006
		Total ILCR	9E-07		Total HI	0.04

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	2.1	1.9E-07	NA	NA	NA
Aroclor-1254	0.057	5.5	1.0E-08	Immunological	4.4	0.01
Aroclor-1260	0.051	5.3	9.6E-09	NA	NA	NA
Dieldrin	0.013	0.93	1.4E-08	Liver	11	0.001
Antimony	5.899	NA	NA	Blood, Mortality	120	0.05
Barium	67.1	NA	NA	Cardiovascular	1600	0.04
Cadmium	1.9	140	1.4E-08	Kidney	120	0.02
Chromium	15.2	21	7.2E-07	Respiratory	270	0.06
Copper	51.1	NA	NA	Gastrointestinal	12000	0.004
Mercury	0.2	NA	NA	Neurological	1100	0.0001
		Total ILCR	1E-06		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	2.4	1.7E-07	NA	NA	NA
Aroclor-1254	0.057	2.7	2.1E-08	Immunological	120	0.0005
Aroclor-1260	0.051	2.7	1.9E-08	NA	NA	NA
Dieldrin	0.013	1.2	1.1E-08	Liver	340	0.00004
Antimony	5.899	NA	NA	Blood, Mortality	6800	0.0009
Barium	67.1	NA	NA	Cardiovascular	1000000	0.00007
Cadmium	1.9	23000	8.3E-11	Kidney	5600	0.0003
Chromium	15.2	3600	4.2E-09	Respiratory	50000	0.0003
Copper	51.1	NA	NA	Gastrointestinal	680000	0.00008
Mercury	0.2	NA	NA	Neurological	140	0.001
		Total ILCR	2E-07		Total HI	0.003

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	1.5	2.7E-07	NA	NA	NA
Aroclor-1254	0.057	5.2	1.1E-08	Immunological	31	0.002
Aroclor-1260	0.051	5.2	9.8E-09	NA	NA	NA
Dieldrin	0.013	0.8	1.6E-08	Liver	91	0.0001
Antimony	5.899	NA	NA	Blood, Mortality	1500	0.004
Barium	67.1	NA	NA	Cardiovascular	250000	0.0003
Cadmium	1.9	100000	1.9E-11	Kidney	1300	0.001
Chromium	15.2	16000	9.5E-10	Respiratory	11000	0.001
Copper	51.1	NA	NA	Gastrointestinal	150000	0.0003
Mercury	0.2	NA	NA	Neurological	8100000	0.00000002
		Total ILCR	3E-07		Total HI	0.009

1 - SCTLs were calculated as per the methodology presented in Appenix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	1.8	2.3E-07	NA	NA	NA
Aroclor-1254	0.057	6.0	9.5E-09	Immunological	73	0.0008
Aroclor-1260	0.051	5.9	8.6E-09	NA	NA	NA
Dieldrin	0.013	0.87	1.5E-08	Liver	200	0.00007
Antimony	5.899	NA	NA	Blood, Mortality	2300	0.003
Barium	67.1	NA	NA	Cardiovascular	390000	0.0002
Cadmium	1.9	61000	3.1E-11	Kidney	2400	0.0008
Chromium	15.2	9400	1.6E-09	Respiratory	17000	0.0009
Copper	51.1	NA	NA	Gastrointestinal	230000	0.0002
Mercury	0.2	NA	NA	Neurological	9500000	0.00000002
		Total ILCR	3E-07		Total HI	0.005

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL(1) (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL(1) (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.409	0.83	4.9E-07			
Aroclor-1254	0.057	2.8	2.0E-08			
Aroclor-1260	0.051	2.8	1.8E-08			
Dieldrin	0.013	0.42	3.1E-08			
Antimony	5.899	NA	NA			
Barium	67.1	NA	NA			
Cadmium	1.9	39000	4.9E-11			
Chromium	15.2	5900	2.6E-09			
Copper	51.1	NA	NA			
Mercury	0.2	NA	NA			
		Total ILCR	6E-07		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.052	0.1	5.2E-07	NA	NA	NA
Barium	175	NA	NA	Cardiovascular	5200	0.03
Cadmium	9	1900	NA	Kidney	75	0.1
Chromium	36.9	290	1.3E-07	Respiratory	210	0.2
Copper	3620	NA	NA	Gastrointestinal	5500	0.7
Mercury	0.43	NA	NA	Neurological	3.4	0.1
		Total ILCR	6E-07		Total HI	1

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.052	0.5	1.0E-07	NA	NA	NA
Barium	175	NA	NA	Cardiovascular	87000	0.002
Cadmium	9	2800	NA	Kidney	1300	0.007
Chromium	36.9	420	8.8E-08	Respiratory	5900	0.006
Copper	3620	NA	NA	Gastrointestinal	76000	0.05
Mercury	0.43	NA	NA	Neurological	26	0.02
		Total ILCR	2E-07		Total HI	0.08

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 16, OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Benzo(a)pyrene Equivalents	0.052	2.1	2.5E-08	NA	NA	NA
Barium	175	NA	NA	Cardiovascular	1600	0.1
Cadmium	9	140	NA	Kidney	120	0.08
Chromium	36.9	21	1.8E-06	Respiratory	270	0.1
Copper	3620	NA	NA	Gastrointestinal	12000	0.3
Mercury	0.43	NA	NA	Neurological	1100	0.0004
		Total ILCR	2E-06		Total HI	0.6

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

LEAD MODELING RESULTS

Calculations of Preliminary Remediation Goals (PRGs)

SITE NAME: NAVAL AIR STATION, WHITING FIELD, MILTON FLORIDA
LOCATION: SITE 16, SOUTHEAST OPEN DISPOSAL AND BURNING AREA - SURFACE SOIL
RECEPTOR: CONSTRUCTION WORKER/TYPICAL OCCUPATIONAL WORKER
DATE: SEPTEMBER 17, 2004

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 Construction Worker	Using Equation 1 Occupational Worker	Using Equation 2 Construction Worker	Using Equation 2 Occupational Worker
PbS	X	X	Soil lead concentration	ug/g or ppm	103	103	103	103
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.200	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.200	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	ug/dL	**2.0**	**1.5**	**2.0**	**1.5**
$PbB_{fetal,0.95}$			**95th percentile PbB among fetuses of adult workers**	ug/dL	**5.9**	**4.6**	**5.9**	**4.6**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	ug/dL	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	%	**0.9%**	**0.3%**	**0.9%**	**0.3%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal,0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal,0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Calculations of Preliminary Remediation Goals (PRGs)

SITE NAME: NAVAL AIR STATION, WHITING FIELD, MILTON FLORIDA
LOCATION: SITE 16, SOUTHEAST OPEN DISPOSAL AND BURNING AREA - SUBSURFACE SOIL
RECEPTOR: CONSTRUCTION WORKER/TYPICAL OCCUPATIONAL WORKER
DATE: SEPTEMBER 17, 2004

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 — Construction Worker	Using Equation 1 — Occupational Worker	Using Equation 2 — Construction Worker	Using Equation 2 — Occupational Worker
PbS	X	X	Soil lead concentration	ug/g or ppm	286	286	286	286
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.07	2.07	2.07	2.07
PbB_0	X	X	Baseline PbB	ug/dL	1.39	1.39	1.39	1.39
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.200	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.200	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}			**PbB of adult worker, geometric mean**	ug/dL	**3.0**	**1.8**	**3.0**	**1.8**
$PbB_{fetal, 0.95}$			**95th percentile PbB among fetuses of adult workers**	ug/dL	**9.0**	**5.4**	**9.0**	**5.4**
PbB_t			**Target PbB level of concern (e.g., 10 ug/dL)**	ug/dL	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$			**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	%	**3.7%**	**0.6%**	**3.7%**	**0.6%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

LEAD MODEL FOR WINDOWS Version 1.0

==
Model Version: 1.0 Build 261
Location: Naval Air Station, Whiting Field, Milton, Florida
Site Name: Site 16 - Surface Soil
Date: 9/17/2004
Run Mode: Site Risk Assessment

Soil/Dust Data
Average concentration of lead in surface soil = 103 mg/kg.
==
The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

==
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 2 of 3)
Site Name: Site 16 - Surface Soil
Date: 9/17/2004
Run Mode: Site Risk Assessment

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 82.100 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	103.000	82.100
1-2	103.000	82.100
2-3	103.000	82.100
3-4	103.000	82.100
4-5	103.000	82.100
5-6	103.000	82.100
6-7	103.000	82.100

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.607	0.000	0.377
1-2	0.034	2.715	0.000	0.939
2-3	0.062	3.068	0.000	0.983
3-4	0.067	2.975	0.000	1.011
4-5	0.067	2.898	0.000	1.061
5-6	0.093	3.070	0.000	1.124
6-7	0.093	3.396	0.000	1.145

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	2.200	5.204	2.8
1-2	3.481	7.170	3.0
2-3	3.503	7.616	2.8
3-4	3.533	7.585	2.7
4-5	2.648	6.674	2.3
5-6	2.393	6.680	2.1
6-7	2.264	6.898	1.9

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================================================================================
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 3 of 3)
Site Name: Site 16 - Surface Soil
Date: 9/17/2004
Run Mode: Site Risk Assessment
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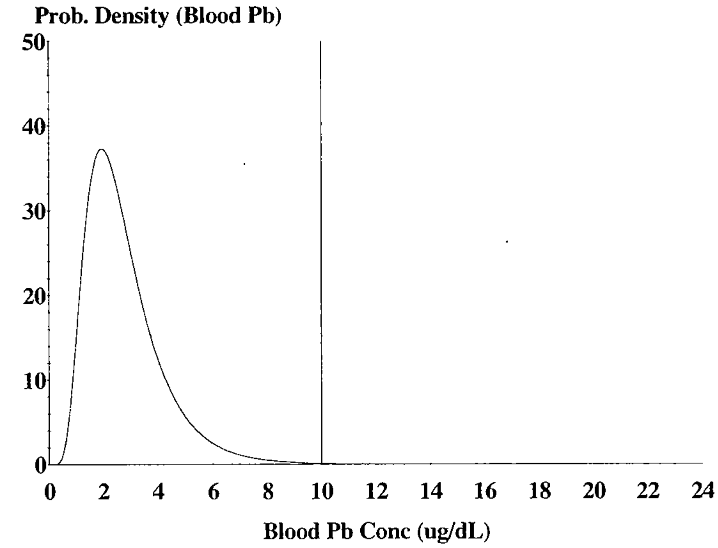
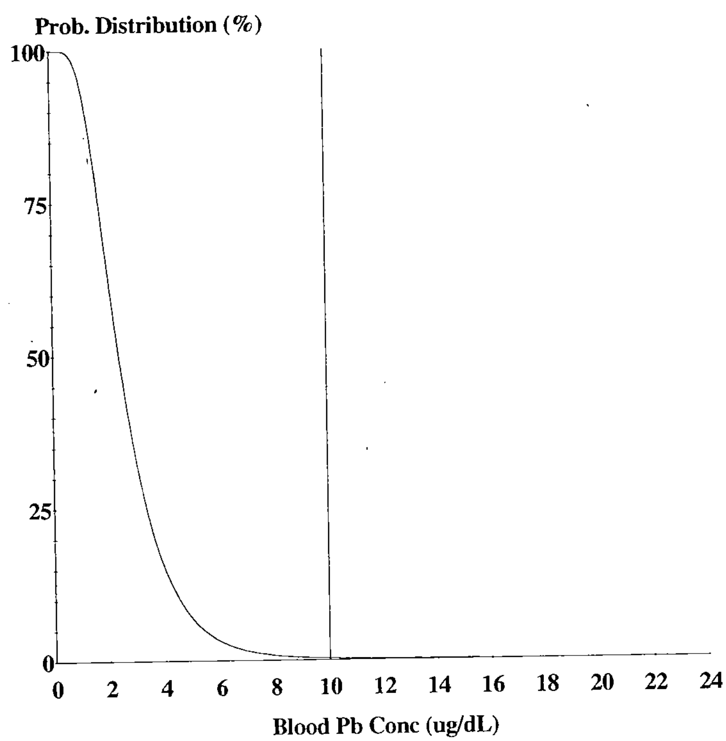


Cutoff = 10.000 ug/dl
Geo Mean = 2.538
GSD = 1.600
% Above = 0.176
% Below = 99.824

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Surface Soil (103 mg/kg)



Cutoff = 10.000 ug/dl
Geo Mean = 2.538
GSD = 1.600
% Above = 0.176

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Surface Soil (103 mg/kg)

LEAD MODEL FOR WINDOWS Version 1.0

==

Model Version: 1.0 Build 261
Location: Naval Air Station, Whiting Field, Milton, Florida
Site Name: Site 16 - Subsurface Soil
Date: 9/17/2004
Run Mode: Site Risk Assessment

Soil/Dust Data
Average concentration of lead in subsurface soil = 286 mg/kg.

==

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

==
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 2 of 3)
Site Name: Site 16 - Subsurface soil
Date: 9/17/2004
Run Mode: Site Risk Assessment

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 210.200 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	286.000	210.200
1-2	286.000	210.200
2-3	286.000	210.200
3-4	286.000	210.200
4-5	286.000	210.200
5-6	286.000	210.200
6-7	286.000	210.200

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

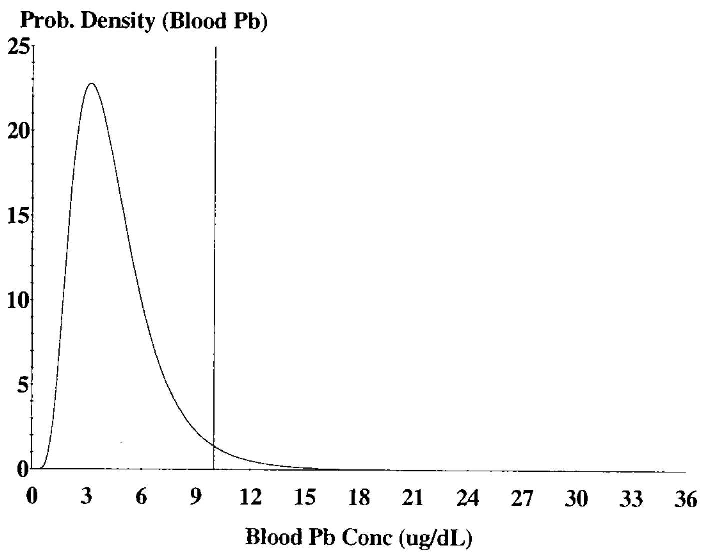
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.508	0.000	0.363
1-2	0.034	2.591	0.000	0.896
2-3	0.062	2.946	0.000	0.944
3-4	0.067	2.872	0.000	0.976
4-5	0.067	2.832	0.000	1.037
5-6	0.093	3.014	0.000	1.103
6-7	0.093	3.341	0.000	1.126

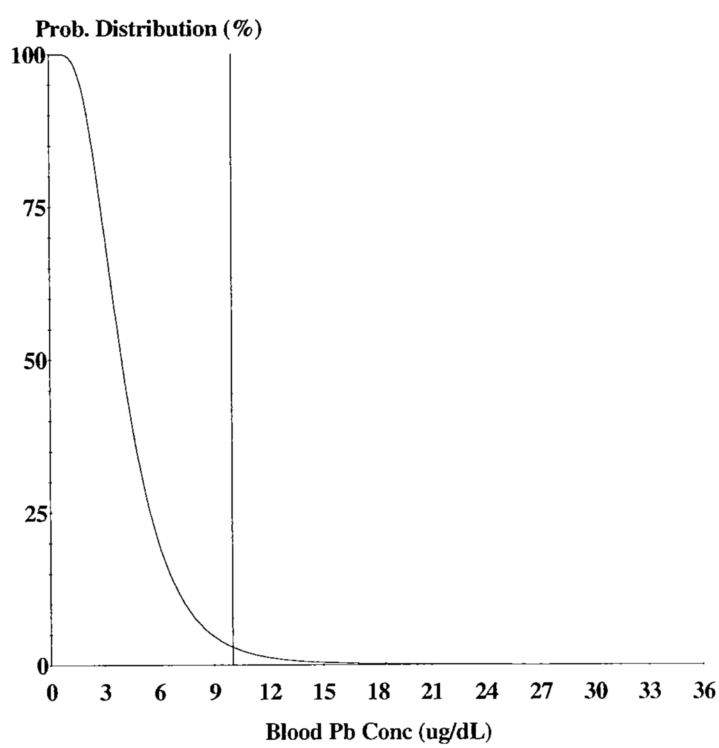
Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	5.650	8.541	4.6
1-2	8.870	12.391	5.1
2-3	8.983	12.936	4.8
3-4	9.108	13.022	4.6
4-5	6.908	10.844	3.8
5-6	6.271	10.481	3.3
6-7	5.947	10.508	3.0

==
Location: Naval Air Station, Whiting Field, Milton, Florida (Page 3 of 3)
Site Name: Site 16 - Subsurface Soil
Date: 9/17/2004
Run Mode: Site Risk Assessment



Cutoff = 10.000 ug/dl
Geo Mean = 4.151
GSD = 1.600
% Above = 3.070
% Below = 96.930

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Subsurface Soil = 286 mg/kg.



Cutoff = 10.000 ug/dl
Geo Mean = 4.151
GSD = 1.600
% Above = 3.070

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Subsurface Soil = 286 mg/kg.

SITE 17, CRASH CREW TRAINING AREA A

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	5900	0.002
Naphthalene	1.18	NA	NA	Body Weight, Nasal	40	0.03
Antimony	2.29	NA	NA	Blood, Mortality	26	0.09
Barium	38.1	NA	NA	Cardiovascular	5200	0.007
Cadmium	3.90	1900	2.1E-09	Kidney	75	0.05
Chromium	25.8	290	8.9E-08	Respiratory	210	0.1
Copper	49.0	NA	NA	Gastrointestinal	5500	0.009
		Total ILCR	9E-08		Total HI	0.3

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	40000	0.0003
Naphthalene	1.18	NA	NA	Body Weight, Nasal	270	0.004
Antimony	2.29	NA	NA	Blood, Mortality	240	0.010
Barium	38.1	NA	NA	Cardiovascular	87000	0.0004
Cadmium	3.90	2800	1.4E-09	Kidney	1300	0.003
Chromium	25.8	420	6.1E-08	Respiratory	5900	0.004
Copper	49.0	NA	NA	Gastrointestinal	76000	0.0006
		Total ILCR	6E-08		Total HI	0.02

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	230	0.05
Naphthalene	1.18	NA	NA	Body Weight, Nasal	57	0.02
Antimony	2.29	NA	NA	Blood, Mortality	120	0.02
Barium	38.1	NA	NA	Cardiovascular	1600	0.02
Cadmium	3.90	140	2.8E-08	Kidney	120	0.03
Chromium	25.8	21	1.2E-06	Respiratory	270	0.10
Copper	49.0	NA	NA	Gastrointestinal	12000	0.004
		Total ILCR	1E-06		Total HI	0.3

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	5700	0.0022
Naphthalene	1.18	NA	NA	Body Weight, Nasal	2400	0.0005
Antimony	2.29	NA	NA	Blood, Mortality	6800	0.0003
Barium	38.1	NA	NA	Cardiovascular	1000000	0.00004
Cadmium	3.90	23000	1.7E-10	Kidney	5600	0.0007
Chromium	25.8	3600	7.2E-09	Respiratory	50000	0.0005
Copper	49.0	NA	NA	Gastrointestinal	680000	0.00007
		Total ILCR	7E-09		Total HI	0.004

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	19000	0.0007
Naphthalene	1.18	NA	NA	Body Weight, Nasal	4400	0.0003
Antimony	2.29	NA	NA	Blood, Mortality	1500	0.002
Barium	38.1	NA	NA	Cardiovascular	250000	0.0002
Cadmium	3.90	100000	3.9E-11	Kidney	1300	0.003
Chromium	25.8	16000	1.6E-09	Respiratory	11000	0.002
Copper	49.0	NA	NA	Gastrointestinal	150000	0.0003
		Total ILCR	2E-09		Total HI	0.008

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA	Body Weight, Mortality, Neurological	22000	0.0006
Naphthalene	1.18	NA	NA	Body Weight, Nasal	5200	0.0002
Antimony	2.29	NA	NA	Blood, Mortality	2300	0.001
Barium	38.1	NA	NA	Cardiovascular	390000	0.0001
Cadmium	3.90	61000	6.4E-11	Kidney	2400	0.002
Chromium	25.8	9400	2.7E-09	Respiratory	17000	0.002
Copper	49.0	NA	NA	Gastrointestinal	230000	0.0002
		Total ILCR	3E-09		Total HI	0.005

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Total Xylenes	12.6	NA	NA			
Naphthalene	1.18	NA	NA			
Antimony	2.29	NA	NA			
Barium	38.1	NA	NA			
Cadmium	3.90	39000	1.0E-10			
Chromium	25.8	5900	4.4E-09			
Copper	49.0	NA	NA			
		Total ILCR	4E-09		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	3.83	NA	NA	Blood, Mortality	26	0.1
Chromium	41.2	290	1.4E-07	Respiratory	210	0.2
		Total ILCR	1E-07		Total HI	0.3

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
Antimony	3.83	NA	NA	Blood, Mortality	240	0.02
Chromium	41.2	420	9.8E-08	Respiratory	5900	0.007
		Total ILCR	1E-07		Total HI	0.02

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 17, CRASH CREW TRAINING AREA A
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
Antimony	3.83	NA	NA	Blood, Mortality	120	0.03
Chromium	41.2	21	2.0E-06	Respiratory	270	0.2
		Total ILCR	2E-06		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

SITE 18, CRASH CREW TRAINING AREA B

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

TABLE 1

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	80	0.06
Naphthalene	2.07	NA	NA	Body Weight, Nasal	40	0.05
Benzo(a)pyrene Equivalents	1.20	0.1	1.2E-05	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	5200	0.02
Cadmium	6.06	1900	3.2E-09	Kidney	75	0.08
Chromium	16	290	5.5E-08	Respiratory	210	0.08
Copper	94.6	NA	NA	Gastrointestinal	5500	0.02
		Total ILCR	1E-05		Total HI	0.3

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	**SCTL(1) (mg/kg)**	**Estimated ILCR**	**Primary Target Organs**	**SCTL(1) (mg/kg)**	**Estimated HQ**
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	560	0.008
Naphthalene	2.07	NA	NA	Body Weight, Nasal	270	0.008
Benzo(a)pyrene Equivalents	1.20	0.5	2.4E-06	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	87000	0.001
Cadmium	6.06	2800	2.2E-09	Kidney	1300	0.005
Chromium	16	420	3.8E-08	Respiratory	5900	0.003
Copper	94.6	NA	NA	Gastrointestinal	76000	0.001
		Total ILCR	2E-06		Total HI	0.03

1 - Table II Soil Cleanup Target Levels (FDEP, August 1999). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, May 26, 1999.

NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	500	0.009
Naphthalene	2.07	NA	NA	Body Weight, Nasal	57	0.04
Benzo(a)pyrene Equivalents	1.20	2.1	5.7E-07	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	1600	0.06
Cadmium	6.06	140	4.3E-08	Kidney	120	0.05
Chromium	16	21	7.6E-07	Respiratory	270	0.06
Copper	94.6	NA	NA	Gastrointestinal	12000	0.008
		Total ILCR	1E-06		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 4

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	17000	0.0003
Naphthalene	2.07	NA	NA	Body Weight, Nasal	2400	0.0009
Benzo(a)pyrene Equivalents	1.20	2.4	5.0E-07	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	1000000	0.0001
Cadmium	6.06	23000	2.6E-10	Kidney	5600	0.001
Chromium	16	3600	4.4E-09	Respiratory	50000	0.0003
Copper	94.6	NA	NA	Gastrointestinal	680000	0.0001
		Total ILCR	5E-07		Total HI	0.003

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 5

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	12000	0.0004
Naphthalene	2.07	NA	NA	Body Weight, Nasal	4400	0.0005
Benzo(a)pyrene Equivalents	1.20	1.5	8.0E-07	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	250000	0.0004
Cadmium	6.06	100000	6.1E-11	Kidney	1300	0.005
Chromium	16	16000	1.0E-09	Respiratory	11000	0.001
Copper	94.6	NA	NA	Gastrointestinal	150000	0.0006
		Total ILCR	8E-07		Total HI	0.008

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA	Body Weight, Nasal	18000	0.0003
Naphthalene	2.07	NA	NA	Body Weight, Nasal	5200	0.0004
Benzo(a)pyrene Equivalents	1.20	1.8	6.7E-07	NA	NA	NA
Barium	97.1	NA	NA	Cardiovascular	390000	0.0002
Cadmium	6.06	61000	9.9E-11	Kidney	2400	0.003
Chromium	16	9400	1.7E-09	Respiratory	17000	0.0009
Copper	94.6	NA	NA	Gastrointestinal	230000	0.0004
		Total ILCR	7E-07		Total HI	0.005

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) and/or reference doses (RfD) available for this chemical.

TABLE 7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	4.59	NA	NA			
Naphthalene	2.07	NA	NA			
Benzo(a)pyrene Equivalents	1.20	0.83	1.4E-06			
Barium	97.1	NA	NA			
Cadmium	6.06	39000	1.6E-10			
Chromium	16	5900	2.7E-09			
Copper	94.6	NA	NA			
		Total ILCR	1E-06		Total HI	

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF).

TABLE 8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	7.13	NA	NA	Body Weight, Nasal	80	0.09
Naphthalene	3.25	NA	NA	Body Weight, Nasal	40	0.08
		Total ILCR	NA		Total HI	0.2

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[(1)] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[(1)] (mg/kg)	Estimated HQ
2-Methylnaphthalene	7.13	NA	NA	Body Weight, Nasal	560	0.01
Naphthalene	3.25	NA	NA	Body Weight, Nasal	270	0.01
		Total ILCR	NA		Total HI	0.02

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE 10

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - CONSTRUCTION WORKERS EXPOSED TO SUBSURFACE SOIL
HUMAN HEALTH RISK ASSESSMENT RE-EVALUATION OF SOILS REPORT
SITE 18, CRASH CREW TRAINING AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON FIELD, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL[1] (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL[1] (mg/kg)	Estimated HQ
2-Methylnaphthalene	7.13	NA	NA	Body Weight, Nasal	500	0.01
Naphthalene	3.25	NA	NA	Body Weight, Nasal	57	0.06
		Total ILCR	NA		Total HI	0.07

1 - SCTLs were calculated as per the methodology presented in Appendix B.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX C

SUPPORTING ECOLOGICAL INFORMATION

APPENDIX C-1

FCM CALCULATIONS

DERIVATION OF EXPOSURE PARAMETERS FOR FOOD CHAIN MODELING

There are several decisions that need to be made in selecting exposure parameters for modeling. The most useful and efficient source for data is the EPA's (1993) Wildlife Exposure Factors Handbook. In this source, food and water ingestion rates are listed as grams ingested per gram of body weight. In nearly all cases there are more body weight data than ingestion rate data, and many times there are only one or two values for an ingestion rate. Arbitrary use of a maximum ingestion rate and a minimum body weight often results in a situation that is less conservative than using averages. This result comes from using the minimum body weight to calculate ingestion. Therefore, other approaches have been taken to ensure that the conservative estimate has a larger ingestion:body mass ratio than the average estimate.

When more than one value for an ingestion rate is available, the maximum is used together with the average body weight to calculate the conservative rate. (The derivation of the parameters is shown in an attached table.) When only one ingestion rate is available, the maximum body weight is used to calculate the conservative ingestion rate. Other decisions are indicated in the table.

TABLE C-1

CONSERVATIVE FOOD CHAIN MODELING PARAMETERS - TERRESTRIAL RECEPTORS

Herbivores, Omnivores

Meadow Vole

Body Weight	0.0170000	kg
Food Ingestion Rate	0.0125213	kg/day
Water Ingestion Rate	0.0075128	L/day
Soil Ingestion Rate	0.0003005	kg/day

American Robin

Body Weight	0.0773000	kg
Food Ingestion Rate	0.1222080	kg/day
Water Ingestion Rate	0.0120680	L/day
Soil Ingestion Rate	0.0127096	kg/day

Soil ing. rate based on woodcock

Deer Mouse

Body Weight	0.0148000	kg
Food Ingestion Rate	0.0092685	kg/day
Water Ingestion Rate	0.0059850	L/day
Soil Ingestion Rate	0.0001854	kg/day

Northern Bobwhite

Body Weight	0.1540000	kg
Food Ingestion Rate	0.0163000	kg/day
Water Ingestion Rate	0.0228000	L/day
Soil Ingestion Rate	0.0013366	kg/day

Soil ing. rate based on Canada goose

Invertivores

Short-Tailed Shrew

Body Weight	0.0150000	kg
Food Ingestion Rate	0.0100000	kg/day
Water Ingestion Rate	0.0042838	L/day
Soil Ingestion Rate	0.0010400	kg/day

Soil ing. rate based on woodcock

American Woodcock

Body Weight	0.1338000	kg
Food Ingestion Rate	0.1678600	kg/day
Water Ingestion Rate	0.0218000	L/day
Soil Ingestion Rate	0.0174574	kg/day

Predators

Red-Tailed Hawk

Body Weight	0.9570000	kg
Food Ingestion Rate	0.1250000	kg/day
Water Ingestion Rate	0.0669000	L/day
Soil Ingestion Rate	0.0035000	kg/day

Soil ing. rate based on red fox

Red Fox

Body Weight	3.9400000	kg
Food Ingestion Rate	0.6349000	kg/day
Water Ingestion Rate	0.3900100	L/day
Soil Ingestion Rate	0.0177772	kg/day

TABLE C-2

AVERAGE FOOD CHAIN MODELING PARAMETERS - TERRESTRIAL RECEPTORS

Herbivores, Omnivores

Meadow Vole

Body Weight	0.035775	kg
Food Ingestion Rate	0.0116269	kg/day
Water Ingestion Rate	0.0062606	L/day
Soil Ingestion Rate	0.000279	kg/day

American Robin

Body Weight	0.0804	kg
Food Ingestion Rate	0.09688	kg/day
Water Ingestion Rate	0.01126	L/day
Soil Ingestion Rate	0.01008	kg/day

Soil ing. rate based on woodcock

Deer Mouse

Body Weight	0.020597	kg
Food Ingestion Rate	0.005527	kg/day
Water Ingestion Rate	0.003913	L/day
Soil Ingestion Rate	0.000111	kg/day

Northern Bobwhite

Body Weight	0.1751000	kg
Food Ingestion Rate	0.0136000	kg/day
Water Ingestion Rate	0.0193000	L/day
Soil Ingestion Rate	0.0011152	kg/day

Soil ing. rate based on Canada goose

Invertivores

Short-Tailed Shrew

Body Weight	0.0161325	kg
Food Ingestion Rate	0.0089535	kg/day
Water Ingestion Rate	0.0035975	L/day
Soil Ingestion Rate	0.000931	kg/day

Soil ing. rate based on woodcock

American Woodcock

Body Weight	0.1730667	kg
Food Ingestion Rate	0.1332613	kg/day
Water Ingestion Rate	0.0173067	L/day
Soil Ingestion Rate	0.013859	kg/day

Predators

Red-Tailed Hawk

Body Weight	1.134	kg
Food Ingestion Rate	0.112	kg/day
Water Ingestion Rate	0.06464	L/day
Soil Ingestion Rate	0.00314	kg/day

Soil ing. rate based on red fox

Red Fox

Body Weight	4.535	kg
Food Ingestion Rate	0.4288	kg/day
Water Ingestion Rate	0.385	L/day
Soil Ingestion Rate	0.01201	kg/day

TABLE C-3

CONSERVATIVE FOOD CHAIN MODELING PARAMETERS - AQUATIC RECEPTORS

Great Blue Heron

Body Weight	2.200	kg
Food Ingestion Rate	0.464	kg/day
Water Ingestion Rate	0.116	L/day
Sediment Ingestion Rate	0.009	kg/day

Sed. ing. rate based on mallard

Bullfrog

Body Weight	0.1428000	kg
Food Ingestion Rate	0.0082170	kg/day
Water Ingestion Rate	(No Data)	L/day
Sediment Ingestion Rate	0.000485	kg/day

Sed. ing. rate from E. painted turtle

Marsh Wren

Body Weight	0.0094000	kg
Food Ingestion Rate	0.0105188	kg/day
Water Ingestion Rate	0.0029750	L/day
Sediment Ingestion Rate	0.000210	kg/day

Sed. ing. rate based on mallard

Largemouth Bass

Body Weight	1.1	kg
Food Ingestion Rate	0.133	kg/day
Water Ingestion Rate	(No Data)	L/day
Sediment Ingestion Rate	(No Data)	kg/day

Raccoon

Body Weight	3.67	kg
Food Ingestion Rate	1.4560	kg/day
Water Ingestion Rate	0.4678	L/day
Sediment Ingestion Rate	0.1369	kg/day

Mink

Body Weight	0.55	kg
Food Ingestion Rate	0.2427	kg/day
Water Ingestion Rate	0.1213	L/day
Sediment Ingestion Rate	0.0228	kg/day

Sed. ing. rate based on raccoon

Osprey

Body Weight	1.36	kg
Food Ingestion Rate	0.404	kg/day
Water Ingestion Rate	0.083	L/day
Sediment Ingestion Rate	0	kg/day

Belted Kingfisher

Body Weight	0.136	kg
Food Ingestion Rate	0.079	kg/day
Water Ingestion Rate	0.017	L/day
Sediment Ingestion Rate	0	kg/day

Bald Eagle

Body Weight	3	kg
Food Ingestion Rate	0.581	kg/day
Water Ingestion Rate	0.154	L/day
Sediment Ingestion Rate	0.0116	kg/day

Sed. ing. rate based on mallard

TABLE C-4

AVERAGE FOOD CHAIN MODELING PARAMETERS - AQUATIC RECEPTORS

Great Blue Heron

Body Weight	2.3095	kg
Food Ingestion Rate	0.41571	kg/day
Water Ingestion Rate	0.103928	L/day
Sediment Ingestion Rate	0.00831	kg/day

Sed. ing. rate based on mallard

Bullfrog

Body Weight	0.1959	kg
Food Ingestion Rate	0.0064647	kg/day
Water Ingestion Rate	(No Data)	L/day
Sediment Ingestion Rate	0.000381	kg/day

Sed. ing. rate from E. painted turtle

Marsh Wren

Body Weight	0.010625	kg
Food Ingestion Rate	0.008739	kg/day
Water Ingestion Rate	0.002869	L/day
Sediment Ingestion Rate	0.000175	kg/day

Sed. ing. rate based on mallard

Largemouth Bass

Body Weight	1.1	kg
Food Ingestion Rate	0.133	kg/day
Water Ingestion Rate	(No Data)	L/day
Sediment Ingestion Rate	(No Data)	kg/day

Raccoon

Body Weight	5.636	kg
Food Ingestion Rate	1.1380	kg/day
Water Ingestion Rate	0.4649	L/day
Sediment Ingestion Rate	0.1070	kg/day

Mink

Body Weight	1.103	kg
Food Ingestion Rate	0.1802	kg/day
Water Ingestion Rate	0.07308	L/day
Sediment Ingestion Rate	0.0169	kg/day

Sed. ing. rate based on raccoon

Osprey

Body Weight	1.57	kg
Food Ingestion Rate	0.33	kg/day
Water Ingestion Rate	0.082	L/day
Sediment Ingestion Rate	0	kg/day

Belted Kingfisher

Body Weight	0.1473	kg
Food Ingestion Rate	0.0736667	kg/day
Water Ingestion Rate	0.016	L/day
Sediment Ingestion Rate	0	kg/day

Bald Eagle

Body Weight	4.15	kg
Food Ingestion Rate	0.498	kg/day
Water Ingestion Rate	0.149	L/day
Sediment Ingestion Rate	0.0100	kg/day

Sed. ing. rate based on mallard

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
Great Blue Heron										
	Body Weight (g)	A B	2229	Body Weight (kg)	2.229					
		A F	2204		2.39	2.20	2.31	Average BW is from study means	Cons. 0.210 Avg. 0.180	1.17
		A M	2576							
	Food Inges-tion Rate (g/g-day)	A B	0.18	Food Inges-tion Rate (kg/day)		0.464	0.416	Highest body weight used for conservative rate		
	Water In-gestion Rate (g/g-day)	A B	0.045	Water In-gestion Rate (L/day)		0.116	0.104	Highest body weight used for conservative rate		
Red-Tailed Hawk										
	Body Weight (g)	A F	1224	Body Weight (kg)	1.126					
		A M	1028							
		A F	1154		1.056					
		A M	957			0.957	1.13	Average BW is from study means	Cons. 0.130 Avg. 0.099	1.32
		A F	1235		1.220					
		A M	1204							
	Food Inges-tion Rate (g/g-day)	A F winter	0.11	Food Inges-tion Rate (kg/day)	0.0987	0.125	0.112	Highest ingestion rate and average body weight used for conservative rate		
		A M winter	0.1							
		A M summer	0.086							
	Water In-gestion Rate (g/g-day)	A F	0.055	Water In-gestion Rate (L/day)	0.0570					
		A M	0.059			0.0669	0.0646	Highest ingestion rate and average body weight used for conservative rate		

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
American Woodcock										
	Body Weight (g)	A M	176	Body Weight (kg)	0.197					
		A F	218							
		A M April	134.6		0.1399					
		A M May	133.8			0.134	0.173	Average BW is from study means	Cons. 1.255 Avg. 0.770	1.63
		A M June	151.2							
		A M summer	145.9		0.1644					
		A F summer	182.9							
		A M fall	169		0.191					
		A F fall	213							
	Food Inges-tion Rate (g/g-day)	A B winter	0.77	Food Inges-tion Rate (kg/day)		0.168	0.133	Highest body weight used for conservative rate		
	Water In-gestion Rate (g/g-day)	A M	0.1	Water In-gestion Rate (L/day)		0.0218	0.0173	Highest body weight used for conservative rate		
		A F	0.1							

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	**Factor**	**Age/Sex/ Cond./Seas.**	**Mean**	**Factor**	**Study Mean**	**Conser- vative**	**Average**	**Notes**	**FIR:BW Ratio**	**Cns:Avg Factor**
Belted Kingfisher										
	Body Weight (g)	A B	148	Body Weight (kg)	0.148					
		A B	136		0.136	0.13600	0.1473	Average BW is from study means	Cons. 0.581 Avg. 0.500	1.16
		A B	158		0.158					
	Food Inges- tion Rate (g/g-day)	A B	0.5	Food Inges- tion Rate (kg/day)		0.079	0.074	Highest body weight used for conservative rate		
	Water In- gestion Rate (g/g-day)	A B	0.11	Water In- gestion Rate (L/day)		0.017	0.016	Highest body weight used for conservative rate		
Marsh Wren										
	Body Weight (g)	F breeding	10.6	Body Weight (kg)	0.011					
		M breeding	11.9							
		A F	9.4		0.010	0.00940	0.0106	Average BW is from study means	Cons. 1.119 Avg. 0.823	1.36
		A M	10.6							
	Food Inges- tion Rate (g/g-day)	A B	0.67	Food Inges- tion Rate (kg/day)	0.670					
		A F	0.99		0.975	0.0105	0.00874	Highest ingestion rate and average body weight used for conservative rate		
		A M	0.96							
	Water In- gestion Rate (g/g-day)	A F	0.28	Water In- gestion Rate (L/day)	0.270	0.00298	0.00287			
		A M	0.26							

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

Species	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
American Robin										
	Body Weight (g)	A B	77.3	Body Weight (kg)	0.0773	0.0773	0.0804	Average BW is from study means	Cons. 1.581	1.31
		A M nonbreed	86.2		0.0849				Avg. 1.205	
		A F nonbreed.	83.6							
		A M breeding	77.4		0.0790					
		A F breeding	80.6							
	Food Ingestion Rate (g/g-day)	B B	0.89	Food Ingestion Rate (kg/day)						
		A B	1.52			0.122	0.0969	Highest ingestion rate and average body weight used for conservative rate		
	Water Ingestion Rate (g/g-day)	A B	0.14	Water Ingestion Rate (L/day)		0.0121	0.0113	Highest body weight used for conservative rate		

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
Northern Bobwhite										
	Body Weight (g)	A B fall	190	Body Weight (kg)	0.1913	0.1540	0.1751	Average BW is from study means	Cons.	
		A B winter	194						0.106	1.36
		A B spring	190						Avg.	
									0.078	
		A M winter	181		0.17675					
		A M summer	163							
		A F winter	183							
		A F summer	180							
		A M winter	161		0.15725					
		A M summer	154							
		A F winter	157							
		A F summer	157							
	Food Ingestion Rate (g/g-day)	A B winter	0.093	Food Ingestion Rate (kg/day)	0.07775					
		A B spring	0.067							
		A B summer	0.079			0.0163	0.0136	Highest ingestion rate and average body weight used for conservative rate		
		A B fall	0.072							
	Water Ingestion Rate (g/g-day)	A M summer	0.1	Water Ingestion Rate (L/day)	0.115	0.0228	0.0193	Highest ingestion rate and average body weight used for conservative rate		
		A F summer	0.13							
		A M summer	0.11		0.105					
		A F summer	0.1							

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

Species	Data from EPA (1993) Factor	Age/Sex/ Cond./Seas.	Mean	Derivation of Factors for Modeling Factor	Study Mean	Conser- vative	Average	Notes	Conservative-Avg. Comparison FIR:BW Ratio	Cns:Avg Factor
Short-Tailed Shrew										
	Body Weight (g)	A B	15	Body Weight (kg)	0.015	0.015	0.0161	Average BW is from study means	Cons. 0.667 Avg. 0.555	1.20
		M summer	19.21		0.0173					
		F summer	17.4							
		M fall	16.87							
		M fall	15.58							
	Food Inges- tion Rate (g/g-day)	A B	0.49	Food Inges- tion Rate (kg/day)						
		A B	0.62			0.0100	0.00895	Highest ingestion rate and average body weight used for conservative rate		
	Water In- gestion Rate (g/g-day)	A B	0.223	Water In- gestion Rate (L/day)		0.00428	0.00360	Highest body weight used for conservative rate		
Raccoon										
	Body Weight (kg)	A M	7.6	Body Weight (kg)	6.667					
		A F parous	6.4							
		A F nulliparous	6							
		A M	6.76		6.250					
		A F	5.74							
		A M	4.31		3.990					
		A F	3.67			3.67	5.64	Average BW is from study means	Cons. 0.397 Avg. 0.202	1.96
	Food Inges- tion Rate (g/g-day)			Food Inges- tion Rate (kg/day)		1.456	1.138	Food ingestion rates calculated from Nagy's equations (EPA, 1993), using maximum body weight for conservative- ness. Dry FIR corrected for 75% water		
	Water In- gestion Rate (g/g-day)	A M	0.082	Water In- gestion Rate (L/day)	0.0825					
		A F	0.083			0.468	0.465	Highest ingestion rate and average body weight used for conservative rate		

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

Species	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
Mink										
	Body Weight (g)	A M spring	1734	Body Weight (kg)	1.354					
		A F spring	974							
		A M summer	1040		0.852					
		A M fall	1233							
		A F summer	550			0.550	1.103	Average BW is from study means	Cons. 0.441 Avg. 0.163	2.70
		A F fall	586							
	Food Ingestion Rate (g/g-day)	A M summer	0.13	Food Ingestion Rate (kg/day)	0.130					
		A M winter	0.12		0.140					
		A F winter	0.16							
		A M yr-round	0.22		0.220	0.243	0.180	Highest ingestion rate and average body weight used for conservative rate		
	Water Ingestion Rate (g/g-day)	A F	0.11	Water Ingestion Rate (L/day)	0.105	0.121	0.073	Highest ingestion rate and average body weight used for conservative rate		
		A M	0.099							
		A F	0.028		0.028					

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

Species	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser-vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor
Red Fox										
	Body Weight (kg)	A M	5.25	Body Weight (kg)	4.690					
		A F	4.13							
		A M	4.82		4.380					
		A F	3.94			3.94	4.54	Average BW is from study means	Cons. 0.161	1.70
	Food Inges-tion Rate (g/g-day)	A	0.075	Food Inges-tion Rate (kg/day)	0.0947				Avg. 0.095	
		F	0.14			0.635	0.429	Highest ingestion rate and average body weight used for conservative rate		
		A nonbreed.	0.069							
	Water In-gestion Rate (g/g-day)	A M	0.084	Water In-gestion Rate (L/day)	0.0850					
		A F	0.086			0.390	0.385	Highest ingestion rate and average body weight used for conservative rate		

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	**Factor**	**Age/Sex/ Cond./Seas.**	**Mean**	**Factor**	**Study Mean**	**Conser- vative**	**Average**	**Notes**	**FIR:BW Ratio**	**Cns:Avg Factor**
Deer Mouse										
	Body	A M	22	Body	0.0210					
	Weight (g)	A F	20	Weight (kg)						
		A M	15.7		0.0153					
		A F	14.8			0.0148	0.0206	Average BW is from study means	Cons.	
									0.626	2.33
		A M	22.3		0.0217				Avg.	
		A F	21.1						0.268	
		A B	19.6		0.0196					
		A F nonbreed.	20.3		0.0254					
		A F gestat.	31.5							
		A F lactat.	24.5							
	Food Inges-	A F nonbreed.	0.19	Food Inges-	0.3200					
	tion Rate	A F lactat.	0.45	tion Rate		0.00927	0.00553	Highest ingestion rate and average body		
	(g/g-day)			(kg/day)				weight used for conservative rate		
		A F nonbreed.	0.18		0.2800					
		A F lactat.	0.38							
		A F nonbreed.	0.19		0.2050					
		A M	0.22							
	Water In-	A B	0.19	Water In-		0.00599	0.00391	Highest body weight used		
	gestion Rate			gestion Rate				for conservative rate		
	(g/g-day)	A B	0.19	(L/day)						

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

Species	Data from EPA (1993) Factor	Age/Sex/ Cond./Seas.	Mean	Derivation of Factors for Modeling Factor	Study Mean	Conser- vative	Average	Notes	Conservative-Avg. Comparison FIR:BW Ratio	Cns:Avg Factor
Meadow Vole										
	Body Weight (g)	A M summer	40	Body Weight (kg)	0.0367					
		A F summer	33.4							
		A M spring	52.4		0.0480					
		A F spring	43.5							
		A B spring	26		0.0212					
		A B summer	24.3							
		A B fall	17			0.0170	0.0358	Average BW is from study means	Cons. 0.737 Avg. 0.325	2.27
		A B winter	17.5							
		A M	35.5		0.0373					
		A F	39							
	Food Ingestion Rate (g/g-day)		0.3	Food Ingestion Rate (kg/day)	0.325					
			0.35			0.0125	0.0116	Highest ingestion rate and average body weight used for conservative rate		
	Water Ingestion Rate (g/g-day)	A B	0.21	Water Ingestion Rate (L/day)		0.00751	0.00626	Highest ingestion rate and average body weight used for conservative rate		
		A B	0.14							
Bullfrog										
	Body Weight (g)	B B	142.8	Body Weight (kg)		0.1428	0.1959		Cons. 0.058 Avg. 0.033	1.74
		A B	249							
	Food Ingestion Rate (g/g-day)		0.033	Food Ingestion Rate (kg/day)		0.00822	0.00646	Highest body weight used for conservative rate		

TABLE C-5

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR FOOD CHAIN MODELING

	Data from EPA (1993)			Derivation of Factors for Modeling					Conservative-Avg. Comparison	
Species	Factor	Age/Sex/ Cond./Seas.	Mean	Factor	Study Mean	Conser- vative	Average	Notes	FIR:BW Ratio	Cns:Avg Factor

Notes:
Data shown are for adults
Entries on adjacent rows are from the same study
A = Adult
F = Female
M = Male
B = Both
FIR = Food Ingestion Rate
BW = Body Weight
Cns = Conservative
Avg = Average

SITE 11

FCM CALCULATIONS

TABLE FCM-1

ESTIMATION OF MAXIMUM CONTAMINANT CONCENTRATIONS IN TERRESTRIAL PLANTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	PLANT BAF (dw/ww)[1]	PLANT CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs				
4,4'-DDD	0.14	3.30E-03	0.0005	RAIS - McKone, 1994.
4,4'-DDE	0.09	3.80E-03	0.0003	RAIS - McKone, 1994.
4,4'-DDT	0.53	1.60E-03	0.0008	RAIS - McKone, 1994.
DDTR	0.76	1.60E-03	0.0012	RAIS - McKone, 1994.
ALPHA-CHLORDANE	0.55	5.00E-03	0.0027	RAIS - McKone, 1994.
GAMMA-CHLORDANE	0.68	5.00E-03	0.0034	RAIS - McKone, 1994.
DIELDRIN	0.21	1.70E-02	0.0036	RAIS - McKone, 1994.
HEPTACHLOR	0.14	2.50E-02	0.0035	RAIS - McKone, 1994.
HEPTACHLOR EPOXIDE	0.06	5.70E-03	0.0004	RAIS - McKone, 1994.
Metals and Inorganic Compounds				
CHROMIUM	19.6	1.23E-02	0.24	ORNL 1998[2]
LEAD	2230	1.17E-02	26.02	ORNL 1998[3]
ZINC	260	1.10E-01	28.55	ORNL 1998[3]

[1] Used 70% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table D-1, ORNL report BJC/OR-133 (ORNL,1998).

[3] Median transfer factors from Table 6, ORNL report BJC/OR-133 (ORNL,1998).

RAIS - Oak Ridge National Laboratory Risk Assessment Information System Electronic Database (2004)

TABLE FCM-2

ESTIMATION OF MAXIMUM CONTAMINANT CONCENTRATIONS IN SOIL INVERTEBRATES
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	INVERTEBRATE BAF[1] (dw/ww)	INVERTEBRATE CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs				
4,4'-DDD	0.14	2.1	0.29	BAF from FCM-3
4,4'-DDE	0.09	2.1	0.18	BAF from FCM-3
4,4'-DDT	0.53	2.1	1.11	BAF from FCM-3
DDTR	0.76	2.1	1.59	BAF from FCM-3
ALPHA-CHLORDANE	0.55	0.8	0.44	BAF from FCM-3
DIELDRIN	0.21	1.06	0.22	BAF from FCM-3
GAMMA-CHLORDANE	0.68	0.8	0.54	BAF from FCM-3
HEPTACHLOR	0.14	1.6	0.22	BAF from FCM-3
HEPTACHLOR EPOXIDE	0.06	0.48	0.03	BAF from FCM-3
Metals and Inorganic Compounds				
CHROMIUM	19.6	0.05	0.96	Sample et al. 1998a[2]
LEAD	2230	0.04	94.91	Sample et al. 1998a[2]
ZINC	260	0.51	133.12	Sample et al. 1998a[2]

[1]Used 84% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table 11, ORNL report ES/ER/TM-220 (Sample et al., 1998a).

EARTHWORM BAFS FOR PESTICIDES
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Study Values: Worm Concentration Dry Weight	Study Values: Worm Concentration Wet Weight	Study Values: Soil Conc. (dry weight)	Study Values: Dry Weight BAF	Study Values: Wet Weight BAF	Calculated Values: Final Dry Weight(1) BAF	Calculated Values: Final Wet Weight(2) BAF	Reference	Comments
DDT	NA	NA	NA	5	NA	5	0.80	1	soil type unknown (11-year field study)
	0.5	NA	1	0.5	NA	0.5	0.080	2	compost (lab)
	6.9	NA	4	1.7	NA	1.7	0.28	2	compost (lab)
	37	NA	16	2.3	NA	2.3	0.37	2	compost (lab)
	159	NA	64	2.5	NA	2.5	0.40	2	compost (lab)
	NA	NA	NA	9	NA	9.0	1.44	3	from data collected in 67 agricultural fields
	NA	NA	NA	NA	1.2-4.9	7.5-31	1.2-4.9	4	agricultural soil (0.94 ppm DDT in soil)
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***13.0***	***2.1***		
Dieldrin	NA	NA	NA	8	NA	8	1.28	1	soil type unknown (11-year field study)
	NA	NA	NA	2.4	NA	2.4	0.38	2	compost (lab) (17 ppm dieldrin in compost)
	NA	NA	NA	5.6	NA	5.6	0.90	2	compost (lab) (17 ppm dieldrin in compost)
	NA	18.4	25	NA	0.74	4.6	0.7	5	compost (20-day lab study)
	NA	24.4	25	NA	0.98	6.1	1.0	5	compost (20-day lab study)
	NA	4.6	10	NA	0.46	2.9	0.5	6	90-day lab study
	NA	9.7	30	NA	0.32	2.0	0.3	6	90-day lab study
	NA	12.4		NA	#DIV/0!	#DIV/0!	#DIV/0!	6	90-day lab study
	NA	13.9	100	NA	0.14	0.87	0.1	6	90-day lab study
	NA	NA	NA	NA	0.97-4	6.16-25	0.97-4	4	agricultural soil (1.36 ppm total aldrin and dieldrin in soil)
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***#DIV/0!***	***#DIV/0!***		
Heptachlor	NA	NA	NA	10	NA	10	1.60	4	soil type unknown (11-year field study)
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***10***	***1.6***		
Chlordane	NA	NA	NA	5	NA	5.0	0.8	3	from data collected in 7 agricultural fields
Heptachlor epoxide	NA	NA	NA	3	NA	3.0	0.48	3	from data collected in 9 agricultural fields

Notes:
BAF - bioaccumulation factor = worm concentration/soil concentration
NA - Not applicable
The percent solids of earthworms is assummed to be 0.16 [Sample et al., 1997])
1 - The calculated dry weight BAF was either obtained directly from the study or was calculated by dividing the wet weight BAF by 0.16
2 - The calculated wet weight BAF was either obtained directly from the study or was calculated by multiplying the dry weight BAF by 0.16
3 - The compost studies were not used in calculation of average BAF because the properties of the compost may be different than soil.
The compost studies were presented for informational purposes only.

References
1 - Beyer and Gish, 1980 and Beyer and Krynitsky, 1989
2 - Davis, 1971
3 - Gish, 1970
4 - Wheatly and Hardman, 1968
5 - Jeffries and Davis, 1968
6 - Venter and Reinecke, 1985

TABLE FCM-4

ESTIMATION OF MAXIMIMUM CONTAMINANT CONCENTRATIONS IN SMALL MAMMALS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	SMALL MAMMAL BAF[1] (dw/ww)	SMALL MAMMAL CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.14	0.134	0.04	BAF from FCM-5
4,4'-DDE	0.09	0.0294	0.01	BAF from FCM-5
4,4'-DDT	0.53	0.1344	0.15	BAF from FCM-5
DDTR	0.76	1	1.59	BAF from FCM-5
ALPHA-CHLORDANE	0.55	1	0.44	BAF from FCM-5
DIELDRIN	0.21	0.9091	0.20	BAF from FCM-5
GAMMA-CHLORDANE	0.68	1	0.54	BAF from FCM-5
HEPTACHLOR	0.14	1	0.22	BAF from FCM-5
HEPTACHLOR EPOXIDE	0.06	1	0.03	BAF from FCM-5
Metals and Inorganic Compounds				
CHROMIUM	19.6	0.0271	0.53	Sample et al. 1998b[2]
LEAD	2230	0.0337	75.21	Sample et al. 1998b[2]
ZINC	260	0.2469	64.21	Sample et al. 1998b[2]

[1]Used 68% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table 7, ORNL report ES/ER/TM-219 (Sample et al., 1998b).

SOIL/DIET TO MAMMAL BIOACCUMULATION FACTORS - PESTICIDES
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Contaminants	Soil/Diet to Mammal Bioaccumulation Factors (BAFs)		
	(90%)	(median)	**Source**
Pesticides/ PCBs			
4,4'-DDD	0.25	0.1344	diet to biota (1)
4,4'-DDE	0.0372	0.0294	diet to biota (1)
4,4'-DDT	0.25	0.1344	diet to biota (1)
DDTR	1	1	NA
Alpha-Chlordane	1	1	NA
Dieldrin	1.4035	0.9091	diet to biota (1)
Gamma-Chlordane	1	1	NA
Heptachlor	1	1	NA
Heptachlor Epoxide	1	1	NA

1 - Value was developed as part of the Ecological Soil Screening Level (SSL) Guidance (EPA, November 2003)
The value in the 90% column is actually the maximum value from the Eco SSL guidance; the value in the median column is the median BAF from the Eco SSL guidance.

NA - none available, 1 is used as a default value

TABLE FCM-6

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Volatile Organic Compounds									
1,2-Dichloroethene (total)	mouse	90 days	oral in water	body/organ wt,bl chem,liver func	452	NOAEL(10)	45.2	subchronic NOAEL/10	Palmer et al (1979) in ORNL (1996)
2-Butanone	rat	3 generations	oral in water	decreased fetal birth weight	3122	reported value	1771	reported value	Cox et al. (1975) in IRIS (2001)
Acetone	rat	90 days	oral intubation	liver and kidney damage	50	subchronic LOAEL/10	10	subchronic NOAEL/10	EPA (1986c) in ORNL (1996)
Benzene	mouse	days 6-12 of gestation	oral gavage	reproduction	263.6	reported value	26.36	LOAEL/10	Nawroot and Staples (1979) in ORNL (1996)
Bromoform	rat	13 weeks	oral gavage	hepatic lesions	35.7	reported value	17.9	reported value	NTP (1989) in IRIS (2001)
Carbon Disulfide	rat (NOAEL); rabbit (LOAEL)	critical lifestage	oral	fetal development	70	reported value	11	reported value	rat-Hardin et al ('81); rabbit- OHMTAD ('90) in Charters et al. ('96)
Methylene Chloride	rat	2 years	oral in water	liver histology	50	reported value	5.85	reported value	NCA (1982) in ORNL (1996)
Tetrachloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	1.4	subchronic NOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Toluene	mouse	days 6-12 of gestation	oral gavage	reproduction	260	reported value	26	LOAEL/10	Nawrot and Staples (1979) in ORNL (1996)
Trichloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	0.7	LOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Xylenes, Total	mouse	days 6-15 of gestation	oral gavage	reproduction	2.6	reported value	2.1	reported value	Marks et al. (1982) in ORNL (1996)
Semivolatile Organic Compounds									
2,4-Dinitrotoluene	rat	1 to 2 years	oral in diet	reproduction	0.6	reported value	0.06	LOAEL/10	Eillis et al. ('70); Lee et al. ('78,'85) in ATSDR (1997)
2-Methylnaphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(b)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(g,h,i)perylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(k)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Bis(2-Ethylhexyl)phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	11	NOAEL(10)	1.1	reported value	Peakall (1974) in ORNL (1996)
	mouse	105 days - critical lifestage	oral in diet	reproduction	183	reported value	18.3	reported value	Lamb et al. (1987) in ORNL (1996)
Butylbenzyl Phthalate	rat	6 months	oral in diet	organ toxicity	470	reported value	159	reported value	NTP (1985) in IRIS (2001)
Chrysene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Di-n-butyl phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	1.1	reported value	0.11	LOAEL/10	Peakall (1974) in ORNL (1996)
	mouse	105 day -critical lifestage	oral in diet	reproduction	1833	reported value	550	reported value	Lamb et al. (1987) in ORNL (1996)
Dibenzo(a,h)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Diethyl Phthalate	mouse	105 day -critical lifestage	oral in diet	reproduction	45830	NOAEL(10)	4583	reported value	Lamb et al. (1987) in ORNL (1996)
Fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Fluorene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Indeno(1,2,3-cd)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene

TABLE FCM-6

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Naphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pentachlorophenol	rat	62 days - critical lifestage	oral in diet	reproduction	2.4	reported value	0.24	reported value	Schwetz et al. (1978) in ORNL (1996)
	Japanese quail	5 days	oral	mortality	68.5	subchronic LOAEL/10	6.85	LOAEL/10	Hill and Camardese (1986) in Sprenger et al. (1996)
Phenanthrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pesticides and PCBs									
4,4'-DDD	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDE	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975)
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDT	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996)
DDTR	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
Aldrin	rat	3 generations	oral in diet	reproduction	1	reported value	0.2	reported value	Treon and Cleveland (1955) in ORNL (1996)
Aroclor-1254	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996)
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996)
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich and Ringer (1977) in ORNL (1996)
Aroclor-1260	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996) - Aroclor 1254
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996) - Aroclor 1254
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich, Ringer (1977) in ORNL (1996) - Aroclor 1254
BHC,alpha	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,beta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,delta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,gamma (Lindane)	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
Chlordane,alpha	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Chlordane,gamma	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Dieldrin	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
DieldrinR	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)

TABLE FCM-6

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Endosulfan II	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endosulfan Sulfate	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endrin	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996)
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996)
Endrin Aldehyde	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Endrin Ketone	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Heptachlor	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996)
Heptachlor Epoxide	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996) for heptachlor
Methoxychlor	rat	11 months - critical lifestage	oral in diet	reproduction	8	reported value	4	reported value	Gray et al. (1988) in ORNL (1996)
Metals and Inorganic Compounds									
Aluminum	ringed dove	4 months in critical lifestage	oral in diet	reproduction	1097	NOAEL(10)	109.7	reported value	Carriere et al. (1986) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	19.3	reported value	1.93	LOAEL/10	Ondreicka et al. (1966) in ORNL (1996)
Antimony	mouse	lifespan	oral in water	longevity	1.25	reported value	0.125	LOAEL/10	Schroeder et al. (1986b) in ORNL (1996)
Arsenic	male Brown-headed Cowbird	7 months	oral in diet	mortality	7.38	reported value	2.46	reported value	USFWS (1969) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	1.26	reported value	0.126	LOAEL/10	Schroeder and Mitchner (1971) in ORNL (1996)
Barium	1-day old chicks	4 weeks	oral in diet	mortality	417	reported value	208	reported value	Johnson et al. (1960) in ORNL (1996)
	rat	16 months	oral in water	growth, hypertension	51	NOAEL(10)	5.1	reported value	Perry et al. (1983) in ORNL (1996)
Beryllium	rat	lifetime	oral in diet	longevity, wieght loss	6.6	NOAEL(10)	0.66	reported value	Schroeder and Mitchner (1975) in ORNL (1996)
Boron	rat	3 generations	oral in diet	reproduction	93.6	reported value	28	reported value	Weir and Fisher (1972) in ORNL (1996)
	Mallard Ducks	gestation, incl. 3 wks prior & post	oral in diet	reproduction	100	reported value	28.8	reported value	Smith and Anders (1989) in ORNL (1996)
Cadmium	Mallard Ducks	90 days - critical lifestage	oral in diet	reproduction	20	reported value	1.45	reported value	White and Finley (1978) in ORNL (1996)
	rat	6 weeks mating/gestation	oral gavage	reproduction	10	reported value	1	reported value	Sutou et al. (1980b) in ORNL (1996)
Chromium, trivalent	Black duck	10 months - critical lifestage	oral in diet	reproduction	5	reported value	1	reported value	Haseltine et al. (unpubl. data) in ORNL (1996)
	rat	90 day and 2 year	oral in diet	longevity, reproduction	27370	NOAEL(10)	2737	reported value	Ivankovic and Preussmann (1975) in ORNL (1996)
Chromium, hexavalent	rat	1 year	oral in water	body wt,food consumption	--	--	3.28	reported value	MacKenzie et al. (1958) in ORNL (1996)
	rat	3 months	oral in water	mortality	13.14	subchronic LOAEL/10	---	---	Steven et al. (1976) in ORNL (1996)
Cobalt	chicken	unknown	oral in diet	appetite, weight	3.1	reported value	0.31	LOAEL/10	NRC (1977) in HSDB (2001)
	rat (weanling)	3.5 months	oral in milk	mortality	1.4	reported value	0.14	LOAEL/10	Patty's Ind. Hygiene (1982) in HSDB (2001)
Copper	1-day old chicks	10 weeks	oral in diet	growth, mortality	61.7	reported value	47	reported value	Mehring et al. (1960) in ORNL (1996)
	mink	357 days- critical lifestage	oral in diet	reproduction	15.4	reported value	11.7	reported value	Aulerich et al. (1982) in ORNL (1996)
Cyanide	rat	gestation and lactation	oral in diet	reproduction	687	NOAEL(10)	68.7	reported value	Tewe and Maner (1981) in ORNL (1996)
Lead	Japanese quail	12 weeks - critical lifestage	oral in diet	reproduction	11.3	reported value	1.13	reported value	Edens et al. (1976) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	8	reported value	Azar et al. (1973) in ORNL (1996)
Iron									
Manganese	Japanese quail - males	75 days	oral in diet	growth,agressiveness	9970	NOAEL(10)	997	reported value	Laskey and Edens (1985) in ORNL (1996)
	rat	through gestation for 224 days	oral in diet	reproduction	284	reported value	88	reported value	Laskey et al. (1982) in ORNL (1996)
Mercury, inorganic	Japanese quail	1 year	oral in diet	reproduction	0.9	reported value	0.45	reported value	Hill and Schaffner (1976) in ORNL (1996)
	mink	6 months - critical lifestage	oral in diet	reproduction	10	NOAEL(10)	1	reported value	Aulerich et al. (1974) in ORNL (1996)
Mercury, methyl	Mallard Ducks	3 generations	oral in diet	reproduction	0.064	reported value	0.0064	LOAEL/10	Heinz (1979) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.16	reported value	0.032	reported value	Verschuuren et al. (1976) in ORNL (1996)
Nickel	juvenile Mallard Ducks	90 days	oral in diet	mortality, growth, behavior	107	reported value	77.4	reported value	Cain and Pafford (1981) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	40	reported value	Ambrose et al. (1976) in ORNL (1996)
Selenium	Mallard Ducks	78 days	oral in diet	reproduction	1	reported value	0.5	reported value	Heinz et al. (1987) in ORNL (1996)
	rat	one year - 2 generations	oral in water	reproduction	0.33	reported value	0.2	reported value	Rosenfeld and Beath (1954) in ORNL (1996)

TABLE FCM-6

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SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Silver	mice	125 days	oral in water	hypoactivity	24	reported value	2.4	LOAEL/10	Rungby and Danscher (1984)
Thallium	rat	60 days	oral in water	reproduction	0.074	subchronic LOAEL/10	0.0074	LOAEL/10	Formigli et al. (1986) in ORNL (1996)
Vanadium	Mallard Ducks	12 weeks	oral in diet	mortality, body wt, blood chem	113.8	NOAEL(10)	11.38	reported value	White and Dieter (1978) in ORNL (1996)
	rat	60 days -critical lifestage	oral intubation	reproduction	2.1	reported value	0.21	LOAEL/10	Domingo et al. (1986) in ORNL (1996)
Zinc	White Leghorn Hens	44 weeks	oral in diet	reproduction	131	reported value	14.5	reported value	Stahl et al. (1990) in ORNL (1996)
	rat	days 1-16 of gestation	oral in diet	reproduction	320	reported value	160	reported value	Schlicker and Cox (1968) in ORNL (1996)

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

NOAELs in mg/kg/day		
Chemical	**Bird**	**Mammal**
Volatile Organic Compounds		
1,1-Dichloroethane		
1,2-Dichloroethene (total)		45.2
1,1,2,2-Tetrachloroethane		
2-Butanone		1771
Acetone		10
Benzene		26.36
Bromoform		17.9
Carbon Disulfide		11
Chloroform		
Dibromochloromethane		
Ethylbenzene		
Methylene Chloride		5.85
Styrene		
Tetrachloroethene		1.4
Toluene		26
Trichloroethane		
Trichloroethene		0.7
Xylenes, Total		2.1
Semivolatile Organic Compounds		
2,4-Dinitrotoluene		0.06
2-Methylnaphthalene	2	1
4-Methylphenol		
Acenaphthene	2	1
Acenaphthylene	2	1
Anthracene	2	1
Benzo(a)anthracene	2	1
Benzo(a)pyrene	2	1
Benzo(b)fluoranthene	2	1
Benzo(g,h,i)perylene	2	1
Benzo(k)fluoranthene	2	1
Bis(2-Ethylhexyl)phthalate	1.1	18.3
Butylbenzyl Phthalate		159
Carbazole		
Chrysene	2	1
Di-n-butyl phthalate	0.11	550
Di-n-octyl phthalate		
Dibenzo(a,h)anthracene	2	1
Dibenzofuran		
Diethyl Phthalate		4583
Fluoranthene	2	1
Fluorene	2	1

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Bird	Mammal
Hexachlorocyclopentadiene		
Indeno(1,2,3-cd)pyrene	2	1
N-Nitrosodiphenylamine		
Naphthalene	2	1
Pentachlorophenol	6.85	0.24
Phenanthrene	2	1
Pyrene	2	1
Miscellaneous Compounds		
Phenols		
Pesticides and PCBs		
4,4'-DDD	0.09	0.8
4,4'-DDE	0.09	0.8
4,4'-DDT	0.09	0.8
DDTR	0.09	0.8
Aldrin		0.2
Aroclor-1254	0.18	0.068
Aroclor-1260	0.18	0.068
Alpha-BHC	0.56	0.014
Beta-BHC	0.56	0.014
BHC,alpha	0.56	0.014
BHC,beta	0.56	0.014
BHC,delta	0.56	0.014
BHC,gamma (Lindane)	0.56	0.014
Chlordane,alpha	2.14	4.6
Chlordane,gamma	2.14	4.6
Dieldrin	0.077	0.02
Endosulfan II	10	0.15
Endosulfan Sulfate	10	0.15
Endrin	0.01	0.092
Endrin Aldehyde	0.01	0.092
Endrin Ketone	0.01	0.092
Fenuron Tca		
Gamma-BHC (Lindane)	0.56	0.014
Heptachlor		0.1
Heptachlor Epoxide		0.1
Methoxychlor		4
Monuron		
Metals and Inorganic Compounds		
Aluminum	109.7	1.93
Antimony		0.125
Arsenic	2.46	0.126
Barium	208	5.1
Beryllium		0.66
Boron	28.8	28
Cadmium	1.45	1

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Bird	Mammal
Calcium		
Chromium	1	2737
Chromium, trivalent	1	2737
Chromium, hexavalent		3.28
Cobalt	0.31	0.14
Copper	47	11.7
Cyanide		68.7
Iron		
Lead	1.13	8
Magnesium		
Manganese	997	88
Mercury	0.0064	0.032
Mercury, Low Level	0.0064	0.032
Mercury, inorganic	0.45	1
Mercury, methyl	0.0064	0.032
Nickel	77.4	40
Potassium		
Selenium	0.5	0.2
Silver		2.4
Sodium		
Thallium		0.0074
Vanadium	11.38	0.21
Zinc	14.5	160

TABLE FCM-8

MAXIMUM EXPOSURE CONCENTRATIONS FOR ECOLOGICAL RECEPTORS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL RECEPTOR MODELS					
	Surface Soil Maximum	Surface Water Maximum	Plant Maximum	Invertebrate Maximum	Small Mammal Maximum
Chemical	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
Pesticides and PCBs					
4,4'-DDD	0.14	0	0.0005	0.29	0.04
4,4'-DDE	0.09	0	0.0003	0.18	0.01
4,4'-DDT	0.53	0	0.0008	1.11	0.15
DDTR	0.76	0	0.0012	1.59	1.59
Alpha-Chlordane	0.55	0	0.0027	0.44	0.44
Gamma-Chlordane	0.68	0	0.0034	0.54	0.54
Dieldrin	0.21	0	0.0036	0.22	0.20
Heptachlor	0.14	0	0.0035	0.22	0.22
Heptachlor Epoxide	0.06	0	0.0004	0.03	0.03
Metals and Inorganic Compounds					
Chromium	19.6	0	0.24	0.96	0.53
Lead	2230	0	26.02	94.91	75.21
Zinc	260	0	28.55	133.12	64.21

TABLE FCM-9

FOOD CHAIN MODEL FOR THE COTTON MOUSE - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Cotton Mouse[1]
(Conservative Inputs)

Body Weight	0.0148000 kg
Food Ingestion Rate	0.0092685 kg/day
Water Ingestion Rate	0.0059850 L/day
Soil Ingestion Rate	0.0001854 kg/day

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.0005	0.002	0.8	2.55E-03
4,4'-DDE	0.09	0	0.0003	0.001	0.8	1.64E-03
4,4'-DDT	0.53	0	0.0008	0.007	0.8	8.96E-03
DDTR	0.76	0	0.0012	0.010	0.8	1.28E-02
Chlordane,alpha	0.55	0	0.0027	0.009	4.6	1.87E-03
Chlordane,gamma	0.68	0	0.0034	0.011	4.6	2.31E-03
Dieldrin	0.21	0	0.0036	0.005	0.02	2.43E-01
Heptachlor	0.14	0	0.0035	0.004	0.1	3.92E-02
Heptachlor Epoxide	0.06	0	0.0004	0.001	0.1	1.01E-02
Metals and Inorganic Compounds						
Chromium	19.6	0	0.2	0.40	2737	1.45E-04
Lead	2230	0	26.0	44.23	8	**5.53E+00**
Zinc	260	0	28.5	21.13	160	1.32E-01

[1] Based on values for the Deer Mouse in USEPA 1993

TABLE FCM-10

FOOD CHAIN MODEL FOR THE SHORT-TAILED SHREW - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Short-Tailed Shrew
(Conservative Inputs)

Body Weight	0.0150000 kg
Food Ingestion Rate	0.0100000 kg/day
Water Ingestion Rate	0.0042838 L/day
Soil Ingestion Rate	0.0010400 kg/day

Soil ing. rate based on woodcock

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.29	0.21	0.8	2.57E-01
4,4'-DDE	0.09	0	0.18	0.13	0.8	1.62E-01
4,4'-DDT	0.53	0	1.11	0.78	0.8	9.73E-01
DDTR	0.76	0	1.59	1.11	0.8	**1.39E+00**
Chlordane,alpha	0.55	0	0.44	0.33	4.6	7.19E-02
Chlordane,gamma	0.68	0	0.54	0.41	4.6	8.88E-02
Dieldrin	0.21	0	0.22	0.16	0.02	**8.15E+00**
Heptachlor	0.14	0	0.22	0.16	0.1	**1.58E+00**
Heptachlor Epoxide	0.06	0	0.03	0.02	0.1	2.44E-01
Metals and Inorganic Compounds						
Chromium	19.6	0	0.96	2.00	2737	7.30E-04
Lead	2230	0	94.91	217.89	8	**2.72E+01**
Zinc	260	0	133.12	106.77	160	6.67E-01

TABLE FCM-11

FOOD CHAIN MODEL FOR THE COMMON BOBWHITE - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Common Bobwhite

(Conservative Inputs)

Body Weight	0.1540000 kg
Food Ingestion Rate	0.0163000 kg/day
Water Ingestion Rate	0.0228000 L/day
Soil Ingestion Rate	0.0013366 kg/day

Soil ing. rate based on Canada goose

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.0005	0.0013	0.09	1.40E-02
4,4'-DDE	0.09	0	0.0003	0.0008	0.09	8.88E-03
4,4'-DDT	0.53	0	0.0008	0.0047	0.09	5.21E-02
DDTR	0.76	0	0.0012	0.0067	0.09	7.45E-02
Chlordane,alpha	0.55	0	0.0027	0.0051	2.14	2.36E-03
Chlordane,gamma	0.68	0	0.0034	0.0062	2.14	2.92E-03
Dieldrin	0.21	0	0.0036	0.0022	0.077	2.86E-02
Heptachlor	0.14	0	0.0035	0.0016	NA	NA
Heptachlor Epoxide	0.06	0	0.0004	0.0006	NA	NA
Metals and Inorganic Compounds						
Chromium	19.6	0	0.2	0.20	1	1.96E-01
Lead	2230	0	26.0	22.11	1.13	**1.96E+01**
Zinc	260	0	28.5	5.28	14.5	3.64E-01

[1] Based on values for the Northern Bobwhite in USEPA 1993

NA - no NOAEL available

TABLE FCM-12

FOOD CHAIN MODEL FOR THE AMERICAN ROBIN - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

American Robin
(Conservative Inputs)

Body Weight	0.0773000 kg
Food Ingestion Rate	0.1222080 kg/day
Water Ingestion Rate	0.0120680 L/day
Soil Ingestion Rate	0.0127096 kg/day

Soil ing. rate based on woodcock

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.29	0.49	0.09	**5.42E+00**
4,4'-DDE	0.09	0	0.18	0.31	0.09	**3.41E+00**
4,4'-DDT	0.53	0	1.11	1.85	0.09	**2.05E+01**
DDTR	0.76	0	1.59	2.64	0.09	**2.93E+01**
Chlordane,alpha	0.55	0	0.44	0.78	2.14	3.67E-01
Chlordane,gamma	0.68	0	0.54	0.97	2.14	4.53E-01
Dieldrin	0.21	0	0.22	0.39	0.077	**5.02E+00**
Heptachlor	0.14	0	0.22	0.37	NA	NA
Heptachlor Epoxide	0.06	0	0.03	0.06	NA	NA
Metals and Inorganic Compounds						
Chromium	19.6	0	0.96	4.74	1	**4.74E+00**
Lead	2230	0	94.91	516.70	1.13	**4.57E+02**
Zinc	260	0	133.12	253.21	14.5	**1.75E+01**

TABLE FCM-13

FOOD CHAIN MODEL FOR THE RED-TAILED HAWK - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Red-Tailed Hawk
(Conservative Inputs)

Body Weight	0.9570000 kg
Food Ingestion Rate	0.1250000 kg/day
Water Ingestion Rate	0.0669000 L/day
Soil Ingestion Rate	0.0035000 kg/day
Soil ing. rate based on red fox	

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Volatile Organic Compounds						
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.04	0.006	0.09	6.30E-02
4,4'-DDE	0.09	0	0.01	0.001	0.09	1.15E-02
4,4'-DDT	0.53	0	0.15	0.021	0.09	2.39E-01
DDTR	0.76	0	1.59	0.211	0.09	**2.34E+00**
Chlordane,alpha	0.55	0	0.44	0.059	2.14	2.77E-02
Chlordane,gamma	0.68	0	0.54	0.073	2.14	3.43E-02
Dieldrin	0.21	0	0.20	0.027	0.08	3.53E-01
Heptachlor	0.14	0	0.22	0.030	NA	NA
Heptachlor Epoxide	0.06	0	0.03	0.004	NA	NA
Metals and Inorganic Compounds						
Chromium	19.6	0	0.53	0.141	1	1.41E-01
Lead	2230	0	75.21	17.980	1.13	**1.59E+01**
Zinc	260	0	64.21	9.337	14.5	6.44E-01

NA - no NOAEL available

TABLE FCM-14

FOOD CHAIN MODEL FOR THE GRAY FOX - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Gray Fox[1]						
Body Weight	3.9400000	kg				
Food Ingestion Rate	0.6349000	kg/day				
Water Ingestion Rate	0.3900100	L/day				
Soil Ingestion Rate	0.0177772	kg/day				
Maximum Concentrations						
ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	0.14	0	0.04	0.01	0.8	8.75E-03
4,4'-DDE	0.09	0	0.01	0.00	0.8	1.59E-03
4,4'-DDT	0.53	0	0.15	0.03	0.8	3.31E-02
DDTR	0.76	0	1.59	0.26	0.8	3.25E-01
Chlordane,alpha	0.55	0	0.44	0.07	4.6	1.59E-02
Chlordane,gamma	0.68	0	0.54	0.09	4.6	1.97E-02
Dieldrin	0.21	0	0.20	0.03	0.02	**1.68E+00**
Heptachlor	0.14	0	0.22	0.04	0.1	3.65E-01
Heptachlor Epoxide	0.06	0	0.03	0.01	0.1	5.12E-02
Metals and Inorganic Compounds						
Chromium	19.6	0	0.53	0.17	2737	6.36E-05
Lead	2230	0	75.21	22.18	8	**2.77E+00**
Zinc	260	0	64.21	11.52	160	7.20E-02
[1] Based on values for the Red Fox in USEPA 1993						

TABLE FCM-15

HAZARD QUOTIENTS USING MAXIMUM SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - CONSERVATIVE INPUTS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse NOAEL HQ	Shrew NOAEL HQ	Bobwhite NOAEL HQ	Robin NOAEL HQ	Hawk NOAEL HQ	Fox NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	2.55E-03	2.57E-01	1.40E-02	**5.42E+00**	6.30E-02	8.75E-03
4,4'-DDE	1.64E-03	1.62E-01	8.88E-03	**3.41E+00**	1.15E-02	1.59E-03
4,4'-DDT	8.96E-03	9.73E-01	5.21E-02	**2.05E+01**	2.39E-01	3.31E-02
DDTR	1.28E-02	**1.39E+00**	7.45E-02	**2.93E+01**	**2.34E+00**	3.25E-01
Chlordane,alpha	1.87E-03	7.19E-02	2.36E-03	3.67E-01	2.77E-02	1.59E-02
Chlordane,gamma	2.31E-03	8.88E-02	2.92E-03	4.53E-01	3.43E-02	1.97E-02
Dieldrin	2.43E-01	**8.15E+00**	2.86E-02	**5.02E+00**	3.53E-01	**1.68E+00**
Heptachlor	3.92E-02	**1.58E+00**	NA	NA	NA	3.65E-01
Heptachlor Epoxide	1.01E-02	2.44E-01	NA	NA	NA	5.12E-02
Metals and Inorganic Compounds						
Chromium	1.45E-04	7.30E-04	1.96E-01	**4.74E+00**	1.41E-01	6.36E-05
Lead	**5.53E+00**	**2.72E+01**	**1.96E+01**	**4.57E+02**	**1.59E+01**	**2.77E+00**
Zinc	1.32E-01	6.67E-01	3.64E-01	**1.75E+01**	6.44E-01	7.20E-02

TABLE FCM-16

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN TERRESTRIAL PLANTS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	PLANT BAF (dw/ww)[1]	PLANT CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.06	3.30E-03	0.0002	RAIS - McKone, 1994.
4,4'-DDE	0.02	3.80E-03	0.0001	RAIS - McKone, 1994.
4,4'-DDT	0.06	1.60E-03	0.0001	RAIS - McKone, 1994.
DDTR	0.14	1.60E-03	0.0002	RAIS - McKone, 1994.
DIELDRIN	0.04	1.70E-02	0.0007	RAIS - McKone, 1994.
HEPTACHLOR	0.04	2.50E-02	0.0011	RAIS - McKone, 1994.
HEPTACHLOR EPOXIDE	0.04	5.70E-03	0.0002	RAIS - McKone, 1994.
Metals and Inorganic Compounds				
CHROMIUM	8.27	1.23E-02	0.10	ORNL 1998[2]
LEAD	93.09	1.17E-02	1.09	ORNL 1998[3]
ZINC	43.93	1.10E-01	4.82	ORNL 1998[3]

[1] Used 70% water content for conversions, based on EPA (1993).
[2] Median transfer factor from Table D-1, ORNL report BJC/OR-133 (ORNL,1998).
[3] Median transfer factors from Table 6, ORNL report BJC/OR-133 (ORNL,1998).
RAIS - Oak Ridge National Laboratory Risk Assessment Information System Electronic Database (2004)

TABLE FCM-17

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN SOIL INVERTEBRATES
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	INVERTEBRATE BAF[1] (dw/ww)	INVERTEBRATE CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.06	2.1	0.12	BAF from FCM-18
4,4'-DDE	0.02	2.1	0.05	BAF from FCM-18
4,4'-DDT	0.06	2.1	0.12	BAF from FCM-18
DDTR	0.14	2.1	0.29	BAF from FCM-18
DIELDRIN	0.04	1.06	0.05	BAF from FCM-18
HEPTACHLOR	0.04	1.6	0.07	BAF from FCM-18
HEPTACHLOR EPOXIDE	0.04	0.48	0.02	BAF from FCM-18
Metals and Inorganic Compounds				
CHROMIUM	8.27	0.05	0.40	Sample et al. 1998a[2]
LEAD	93.1	0.04	3.96	Sample et al. 1998a[2]
ZINC	43.9	0.51	22.49	Sample et al. 1998a[2]

[1]Used 84% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table 11, ORNL report ES/ER/TM-220 (Sample et al., 1998a).

EARTHWORM BAFS FOR PESTICIDES
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Study Values					Calculated Values		Reference	Comments
	Worm Concentration		Soil	Dry	Wet	Final	Final		
	Dry Weight	Wet Weight	Conc. (dry weight)	Weight BAF	Weight BAF	Dry Weight[(1)] BAF	Wet Weight[(2)] BAF		
DDT	NA	NA	NA	5	NA	5	0.80	1	soil type unknown (11-year field study)
	0.5	NA	1	0.5	NA	0.5	0.080	2	compost (lab)
	6.9	NA	4	1.7	NA	1.7	0.28	2	compost (lab)
	37	NA	16	2.3	NA	2.3	0.37	2	compost (lab)
	159	NA	64	2.5	NA	2.5	0.40	2	compost (lab)
	NA	NA	NA	9	NA	9.0	1.44	3	from data collected in 67 agricultural fields
	NA	NA	NA	NA	1.2-4.9	7.5-31	1.2-4.9	4	agricultural soil (0.94 ppm DDT in soil)
Average dry/wet weight BAF from field studies[(3)]				***NA***	***NA***	***13.0***	***2.1***		
Dieldrin	NA	NA	NA	8	NA	8	1.28	1	soil type unknown (11-year field study)
	NA	NA	NA	2.4	NA	2.4	0.38	2	compost (lab) (17 ppm dieldrin in compost)
	NA	NA	NA	5.6	NA	5.6	0.90	2	compost (lab) (17 ppm dieldrin in compost)
	NA	18.4	25	NA	0.74	4.6	0.7	5	compost (20-day lab study)
	NA	24.4	25	NA	0.98	6.1	1.0	5	compost (20-day lab study)
	NA	4.6	10	NA	0.46	2.9	0.5	6	90-day lab study
	NA	9.7	30	NA	0.32	2.0	0.3	6	90-day lab study
	NA	12.4	50	NA	0.25	1.6	0.2	6	90-day lab study
	NA	13.9	100	NA	0.14	0.87	0.1	6	90-day lab study
	NA	NA	NA	NA	0.97-4	6.16-25	0.97-4	4	agricultural soil (1.36 ppm total aldrin and dieldrin in soil)
Average dry/wet weight BAF from field studies[(3)]				***NA***	***NA***	***6.64***	***1.06***		
Heptachlor	NA	NA	NA	10	NA	10	1.60	4	soil type unknown (11-year field study)
Average dry/wet weight BAF from field studies[(3)]				***NA***	***NA***	***10***	***1.6***		
Heptachlor epoxide	NA	NA	NA	3	NA	3.0	0.48	3	from data collected in 9 agricultural fields

Notes:
BAF - bioaccumulation factor = worm concentration/soil concentration
NA - Not applicable
The percent solids of earthworms is assummed to be 0.16 [Sample et al., 1997])
1 - The calculated dry weight BAF was either obtained directly from the study or was calculated by dividing the wet weight BAF by 0.16
2 - The calculated wet weight BAF was either obtained directly from the study or was calculated by multiplying the dry weight BAF by 0.16
3 - The compost studies were not used in calculation of average BAF because the properties of the compost may be different than soil.
The compost studies were presented for informational purposes only.

References
1 - Beyer and Gish, 1980 and Beyer and Krynitsky, 1989
2 - Davis, 1971
3 - Gish, 1970
4 - Wheatly and Hardman, 1968
5 - Jeffries and Davis, 1968
6 - Venter and Reinecke, 1985

TABLE FCM-19

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN SMALL MAMMALS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	SMALL MAMMAL BAF[1] (dw/ww)	SMALL MAMMAL CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.06	0.13	0.02	BAF from FCM-20
4,4'-DDE	0.02	0.03	0.00	BAF from FCM-20
4,4'-DDT	0.06	0.13	0.02	BAF from FCM-20
DDTR	0.14	1.00	0.29	BAF from FCM-20
DIELDRIN	0.04	0.91	0.04	BAF from FCM-20
HEPTACHLOR	0.04	1.00	0.07	BAF from FCM-20
HEPTACHLOR EPOXIDE	0.04	1.00	0.02	BAF from FCM-20
Metals and Inorganic Compounds				
CHROMIUM	8.27	0.03	0.22	Sample et al. 1998b[2]
LEAD	93.1	0.03	3.14	Sample et al. 1998b[2]
ZINC	43.9	0.25	10.85	Sample et al. 1998b[2]

[1]Used 68% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table 7, ORNL report ES/ER/TM-219 (Sample et al., 1998b).

SOIL/DIET TO MAMMAL BIOACCUMULATION FACTORS - PESTICIDES
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Contaminants	Soil/Diet to Mammal Bioaccumulation Factors (BAFs)		
	(90%)	(median)	Source
Pesticides/ PCBs			
4,4'-DDD	0.25	0.1344	diet to biota (1)
4,4'-DDE	0.0372	0.0294	diet to biota (1)
4,4'-DDT	0.25	0.1344	diet to biota (1)
DDTR	1	1	NA
Dieldrin	1.4035	0.9091	diet to biota (1)
Heptachlor	1	1	NA
Heptachlor Epoxide	1	1	NA

1 - Value was developed as part of the Ecological Soil Screening Level (SSL) Guidance (EPA, November 2003) The value in the 90% column is actually the maximum value from theEco SSL guidance; the value in the median column is the median BAF from the Eco SSL guidance.

NA - none available, 1 is used as a default value

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Volatile Organic Compounds									
1,2-Dichloroethene (total)	mouse	90 days	oral in water	body/organ wt,bl chem,liver func	452	NOAEL(10)	45.2	subchronic NOAEL/10	Palmer et al (1979) in ORNL (1996)
2-Butanone	rat	3 generations	oral in water	decreased fetal birth weight	3122	reported value	1771	reported value	Cox et al. (1975) in IRIS (2001)
Acetone	rat	90 days	oral intubation	liver and kidney damage	50	subchronic LOAEL/10	10	subchronic NOAEL/10	EPA (1986c) in ORNL (1996)
Benzene	mouse	days 6-12 of gestation	oral gavage	reproduction	263.6	reported value	26.36	LOAEL/10	Nawroot and Staples (1979) in ORNL (1996)
Bromoform	rat	13 weeks	oral gavage	hepatic lesions	35.7	reported value	17.9	reported value	NTP (1989) in IRIS (2001)
Carbon Disulfide	rat (NOAEL); rabbit (LOAEL)	critical lifestage	oral	fetal development	70	reported value	11	reported value	rat-Hardin et al ('81); rabbit- OHMTAD ('90) in Charters et al. ('96)
Methylene Chloride	rat	2 years	oral in water	liver histology	50	reported value	5.85	reported value	NCA (1982) in ORNL (1996)
Tetrachloroethene	mouse	6 weeks	oral gavage	hepatotoxicity	7	subchronic LOAEL/10	1.4	subchronic NOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Toluene	mouse	days 6-12 of gestation	oral gavage	reproduction	260	reported value	26	LOAEL/10	Nawrot and Staples (1979) in ORNL (1996)
Trichloroethene	mouse	6 weeks	oral gavage	hepatotoxicity	7	subchronic LOAEL/10	0.7	LOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Xylenes, Total	mouse	days 6-15 of gestation	oral gavage	reproduction	2.6	reported value	2.1	reported value	Marks et al. (1982) in ORNL (1996)
Semivolatile Organic Compounds									
2,4-Dinitrotoluene	rat	1 to 2 years	oral in diet	reproduction	0.6	reported value	0.06	LOAEL/10	Eillis et al. ('70); Lee et al. ('78,'85) in ATSDR (1997)
2-Methylnaphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(b)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(g,h,i)perylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(k)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Bis(2-Ethylhexyl)phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	11	NOAEL(10)	1.1	reported value	Peakall (1974) in ORNL (1996)
	mouse	105 days - critical lifestage	oral in diet	reproduction	183	reported value	18.3	reported value	Lamb et al. (1987) in ORNL (1996)
Butylbenzyl Phthalate	rat	6 months	oral in diet	organ toxicity	470	reported value	159	reported value	NTP (1985) in IRIS (2001)
Chrysene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Di-n-butyl phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	1.1	reported value	0.11	LOAEL/10	Peakall (1974) in ORNL (1996)
	mouse	105 day -critical lifestage	oral in diet	reproduction	1833	reported value	550	reported value	Lamb et al. (1987) in ORNL (1996)
Dibenzo(a,h)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Diethyl Phthalate	mouse	105 day -critical lifestage	oral in diet	reproduction	45830	NOAEL(10)	4583	reported value	Lamb et al. (1987) in ORNL (1996)
Fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Fluorene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Indeno(1,2,3-cd)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Naphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P

TABLE FCM-21

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pentachlorophenol	rat	62 days - critical lifestage	oral in diet	reproduction	2.4	reported value	0.24	reported value	Schwetz et al. (1978) in ORNL (1996)
	Japanese quail	5 days	oral	mortality	68.5	subchronic LOAEL/10	6.85	LOAEL/10	Hill and Camardese (1986) in Sprenger et al. (1996)
Phenanthrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pesticides and PCBs									
4,4'-DDD	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDE	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975)
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDT	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996)
DDTR	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
Aldrin	rat	3 generations	oral in diet	reproduction	1	reported value	0.2	reported value	Treon and Cleveland (1955) in ORNL (1996)
Aroclor-1254	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996)
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996)
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich and Ringer (1977) in ORNL (1996)
Aroclor-1260	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996) - Aroclor 1254
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996) - Aroclor 1254
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich, Ringer (1977) in ORNL (1996) - Aroclor 1254
BHC,alpha	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,beta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,delta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,gamma (Lindane)	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
Chlordane,alpha	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Chlordane,gamma	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Dieldrin	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
DieldrinR	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
Endosulfan II	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endosulfan Sulfate	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endrin	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996)
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996)
Endrin Aldehyde	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Endrin Ketone	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Heptachlor	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996)

TABLE FCM-21

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Heptachlor Epoxide	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996) for heptachlor
Methoxychlor	rat	11 months - critical lifestage	oral in diet	reproduction	8	reported value	4	reported value	Gray et al. (1988) in ORNL (1996)
Metals and Inorganic Compounds									
Aluminum	ringed dove	4 months in critical lifestage	oral in diet	reproduction	1097	NOAEL(10)	109.7	reported value	Carriere et al. (1986) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	19.3	reported value	1.93	LOAEL/10	Ondreicka et al. (1966) in ORNL (1996)
Antimony	mouse	lifespan	oral in water	longevity	1.25	reported value	0.125	LOAEL/10	Schroeder et al. (1986b) in ORNL (1996)
Arsenic	male Brown-headed Cowbird	7 months	oral in diet	mortality	7.38	reported value	2.46	reported value	USFWS (1969) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	1.26	reported value	0.126	LOAEL/10	Schroeder and Mitchner (1971) in ORNL (1996)
Barium	1-day old chicks	4 weeks	oral in diet	mortality	417	reported value	208	reported value	Johnson et al. (1960) in ORNL (1996)
	rat	16 months	oral in water	growth, hypertension	51	NOAEL(10)	5.1	reported value	Perry et al. (1983) in ORNL (1996)
Beryllium	rat	lifetime	oral in diet	longevity, wieght loss	6.6	NOAEL(10)	0.66	reported value	Schroeder and Mitchner (1975) in ORNL (1996)
Boron	rat	3 generations	oral in diet	reproduction	93.6	reported value	28	reported value	Weir and Fisher (1972) in ORNL (1996)
	Mallard Ducks	gestation, incl. 3 wks prior & post	oral in diet	reproduction	100	reported value	28.8	reported value	Smith and Anders (1989) in ORNL (1996)
Cadmium	Mallard Ducks	90 days - critical lifestage	oral in diet	reproduction	20	reported value	1.45	reported value	White and Finley (1978) in ORNL (1996)
	rat	6 weeks mating/gestation	oral gavage	reproduction	10	reported value	1	reported value	Sutou et al. (1980b) in ORNL (1996)
Chromium, trivalent	Black duck	10 months - critical lifestage	oral in diet	reproduction	5	reported value	1	reported value	Haseltine et al. (unpubl. data) in ORNL (1996)
	rat	90 day and 2 year	oral in diet	longevity, reproduction	27370	NOAEL(10)	2737	reported value	Ivankovic and Preussmann (1975) in ORNL (1996)
Chromium, hexavalent	rat	1 year	oral in water	body wt,food consumption	--	--	3.28	reported value	MacKenzie et al. (1958) in ORNL (1996)
	rat	3 months	oral in water	mortality	13.14	subchronic LOAEL/10	---	---	Steven et al. (1976) in ORNL (1996)
Cobalt	chicken	unknown	oral in diet	appetite, weight	3.1	reported value	0.31	LOAEL/10	NRC (1977) in HSDB (2001)
	rat (weanling)	3.5 months	oral in milk	mortality	1.4	reported value	0.14	LOAEL/10	Patty's Ind. Hygiene (1982) in HSDB (2001)
Copper	1-day old chicks	10 weeks	oral in diet	growth, mortality	61.7	reported value	47	reported value	Mehring et al. (1960) in ORNL (1996)
	mink	357 days- critical lifestage	oral in diet	reproduction	15.4	reported value	11.7	reported value	Aulerich et al. (1982) in ORNL (1996)
Cyanide	rat	gestation and lactation	oral in diet	reproduction	687	NOAEL(10)	68.7	reported value	Tewe and Maner (1981) in ORNL (1996)
Lead	Japanese quail	12 weeks - critical lifestage	oral in diet	reproduction	11.3	reported value	1.13	reported value	Edens et al. (1976) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	8	reported value	Azar et al. (1973) in ORNL (1996)
Iron									
Manganese	Japanese quail - males	75 days	oral in diet	growth,agressiveness	9970	NOAEL(10)	997	reported value	Laskey and Edens (1985) in ORNL (1996)
	rat	through gestation for 224 days	oral in diet	reproduction	284	reported value	88	reported value	Laskey et al. (1982) in ORNL (1996)
Mercury, inorganic	Japanese quail	1 year	oral in diet	reproduction	0.9	reported value	0.45	reported value	Hill and Schaffner (1976) in ORNL (1996)
	mink	6 months - critical lifestage	oral in diet	reproduction	10	NOAEL(10)	1	reported value	Aulerich et al. (1974) in ORNL (1996)
Mercury, methyl	Mallard Ducks	3 generations	oral in diet	reproduction	0.064	reported value	0.0064	LOAEL/10	Heinz (1979) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.16	reported value	0.032	reported value	Verschuuren et al. (1976) in ORNL (1996)
Nickel	juvenile Mallard Ducks	90 days	oral in diet	mortality, growth, behavior	107	reported value	77.4	reported value	Cain and Pafford (1981) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	40	reported value	Ambrose et al. (1976) in ORNL (1996)
Selenium	Mallard Ducks	78 days	oral in diet	reproduction	1	reported value	0.5	reported value	Heinz et al. (1987) in ORNL (1996)
	rat	one year - 2 generations	oral in water	reproduction	0.33	reported value	0.2	reported value	Rosenfeld and Beath (1954) in ORNL (1996)
Silver	mice	125 days	oral in water	hypoactivity	24	reported value	2.4	LOAEL/10	Rungby and Danscher (1984)
Thallium	rat	60 days	oral in water	reproduction	0.074	subchronic LOAEL/10	0.0074	LOAEL/10	Formigli et al. (1986) in ORNL (1996)
Vanadium	Mallard Ducks	12 weeks	oral in diet	mortality, body wt, blood chem	113.8	NOAEL(10)	11.38	reported value	White and Dieter (1978) in ORNL (1996)
	rat	60 days -critical lifestage	oral intubation	reproduction	2.1	reported value	0.21	LOAEL/10	Domingo et al. (1986) in ORNL (1996)
Zinc	White Leghorn Hens	44 weeks	oral in diet	reproduction	131	reported value	14.5	reported value	Stahl et al. (1990) in ORNL (1996)
	rat	days 1-16 of gestation	oral in diet	reproduction	320	reported value	160	reported value	Schlicker and Cox (1968) in ORNL (1996)

TABLE FCM-22

NO OBSERVED ADVERSE EFFECT LEVELS, LOWEST OBSERVED ADVERSE EFFECT LEVELS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION,
WHITING FIELD
MILTON, FLORIDA

	NOAELs		LOAELs	
Chemical	**Bird**	**Mammal**	**Bird**	**Mammal**
Pesticides and PCBs				
4,4'-DDD	0.09	0.8	0.9	4
4,4'-DDE	0.09	0.8	0.9	4
4,4'-DDT	0.09	0.8	0.9	4
DDTR	0.09	0.8	0.9	4
Dieldrin	0.077	0.02	0.77	0.2
Heptachlor		0.1		1
Heptachlor Epoxide		0.1		1
Metals and Inorganic Compounds				
Chromium	1	2737	5	27370
Lead	1.13	8	11.3	80
Zinc	14.5	160	131	320
**NOAELs and LOAELs are in mg/kg.day				

TABLE FCM-23

MEAN EXPOSURE CONCENTRATIONS FOR ECOLOGICAL RECEPTORS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL RECEPTOR MODELS					
	Surface Soil	Surface Water	Plant	Invertebrate	Small Mammal
	Mean	Mean	Mean	Mean	Mean
Chemical	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
Pesticides and PCBs					
4,4'-DDD	0.06	0.00	0.0002	0.12	0.02
4,4'-DDE	0.02	0.00	0.0001	0.05	0.001
4,4'-DDT	0.06	0.00	0.0001	0.12	0.02
DDTR	0.14	0.00	0.0002	0.29	0.29
Dieldrin	0.04	0.00	0.0007	0.05	0.04
Heptachlor	0.04	0.00	0.0011	0.07	0.07
Heptachlor Epoxide	0.04	0.00	0.0002	0.02	0.02
Metals and Inorganic Compounds					
Chromium	8.27	0.00	0.1017	0.40	0.22
Lead	93.09	0.00	1.0864	3.96	3.14
Zinc	43.93	0.00	4.8233	22.49	10.85

TABLE FCM-24

FOOD CHAIN MODEL FOR THE COTTON MOUSE - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Cotton Mouse[1]
(Average Inputs)

Body Weight	0.0205970 kg
Food Ingestion Rate	0.0055270 kg/day
Water Ingestion Rate	0.0039130 L/day
Soil Ingestion Rate	0.0001105 kg/day
Site Use Factor	1 (3.0 acre site/0.15 acre mean home range)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.0	0.00	0.8	4.48E-04	4	8.97E-05
4,4'-DDE	0.02	0	0.0	0.00	0.8	1.83E-04	4	3.67E-05
4,4'-DDT	0.06	0	0.0	0.00	0.8	4.07E-04	4	8.14E-05
DDTR	0.14	0	0.0	0.00	0.8	9.89E-04	4	1.98E-04
Dieldrin	0.04	0	0.0	0.00	0.02	2.16E-02	0.2	2.16E-03
Heptachlor	0.04	0	0.0	0.00	0.1	5.22E-03	1	5.2E-04
Heptachlor Epoxide	0.04	0	0.0	0.00	0.1	2.68E-03	1	2.68E-04
Metals and Inorganic Compounds								
Chromium	8.27	0	0.1	0.07	2737	2.62E-05	27370	2.62E-06
Lead	93.09	0	1.1	0.79	8	9.89E-02	80	9.89E-03
Zinc	43.93	0	4.8	1.53	160	9.56E-03	320	4.78E-03

[1] Based on values for the Deer Mouse in USEPA 1993

TABLE FCM-25

FOOD CHAIN MODEL FOR THE SHORT-TAILED SHREW - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Short-Tailed Shrew
(Average Inputs)

Body Weight	0.0161330	kg
Food Ingestion Rate	0.0089540	kg/day
Water Ingestion Rate	0.0035980	L/day
Soil Ingestion Rate	0.0009312	kg/day
Site Use Factor	1	(3.0 acre site/0.37 acre mean home range)

Soil ing. rate based on woodcock

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.12	0.07	0.8	8.77E-02	4	1.8E-02
4,4'-DDE	0.02	0	0.05	0.03	0.8	3.51E-02	4	7.0E-03
4,4'-DDT	0.06	0	0.12	0.07	0.8	8.59E-02	4	1.7E-02
DDTR	0.14	0	0.29	0.17	0.8	2.09E-01	4	4.2E-02
Dieldrin	0.04	0	0.05	0.03	0.02	**1.41E+00**	0.2	1.4E-01
Heptachlor	0.04	0	0.07	0.04	0.1	4.09E-01	1	4.1E-02
Heptachlor Epoxide	0.04	0	0.02	0.01	0.1	1.26E-01	1	1.3E-02
Metals and Inorganic Compounds								
Chromium	8.27	0	0.40	0.70	2737	2.57E-04	27370	2.6E-05
Lead	93.09	0	3.96	7.57	8	9.47E-01	80	9.5E-02
Zinc	43.93	0	22.49	15.02	160	9.39E-02	320	4.7E-02

TABLE FCM-26

FOOD CHAIN MODEL FOR THE COMMON BOBWHITE - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Common Bobwhite
(Average Inputs)

Body Weight	0.1751000 kg
Food Ingestion Rate	0.0136000 kg/day
Water Ingestion Rate	0.0193000 L/day
Soil Ingestion Rate	0.0011152 kg/day
Site Use Factor	0.1 (3.0 acre site/24.6 acre mean home range = 0.004)

Soil ing. rate based on Canada goose

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.0	0.00	0.09	4.22E-04	4	9.5E-06
4,4'-DDE	0.02	0	0.0	0.00	0.09	1.70E-04	4	3.8E-06
4,4'-DDT	0.06	0	0.0	0.00	0.09	4.05E-04	4	9.1E-06
DDTR	0.14	0	0.0	0.00	0.09	9.85E-04	4	2.2E-05
Dieldrin	0.04	0	0.0	0.00	0.077	4.35E-04	0.2	1.7E-04
Heptachlor	0.04	0	0.0	0.00	NA	NA	1	NA
Heptachlor Epoxide	0.04	0	0.0	0.00	NA	NA	1	NA
Metals and Inorganic Compounds							0	
Chromium	8.27	0	0.1	0.01	1	6.06E-03	27370	2.2E-07
Lead	93.09	0	1.1	0.07	1.13	5.99E-02	80	8.5E-04
Zinc	43.93	0	4.8	0.07	14.5	4.51E-03	320	2.0E-04

[1] Based on values for the Northern Bobwhite in USEPA 1993

NA - no NOAEL available

TABLE FCM-27

FOOD CHAIN MODEL FOR THE AMERICAN ROBIN - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

American Robin
(Average Inputs)

Body Weight	0.0804000 kg
Food Ingestion Rate	0.0968800 kg/day
Water Ingestion Rate	0.0112600 L/day
Soil Ingestion Rate	0.0100755 kg/day
Site Use Factor	1 (3.0 acre site/1.11 acre mean home range)

Soil ing. rate based on woodcock

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.12	0.15	0.09	**1.69E+00**	4	3.81E-02
4,4'-DDE	0.02	0	0.05	0.06	0.09	6.78E-01	4	1.53E-02
4,4'-DDT	0.06	0	0.12	0.15	0.09	**1.66E+00**	4	3.73E-02
DDTR	0.14	0	0.29	0.36	0.09	**4.03E+00**	4	9.06E-02
Dieldrin	0.04	0	0.05	0.06	0.077	7.94E-01	0.2	3.06E-01
Heptachlor	0.04	0	0.07	0.09	NA	NA	1	NA
Heptachlor Epoxide	0.04	0	0.02	0.03	NA	NA	1	NA
Metals and Inorganic Compounds								
Chromium	8.27	0	0.40	1.52	1	**1.52E+00**	27370	5.57E-05
Lead	93.09	0	3.96	16.44	1.13	**1.45E+01**	80	2.06E-01
Zinc	43.93	0	22.49	32.61	14.5	**2.25E+00**	320	1.0E-01

TABLE FCM-28

FOOD CHAIN MODEL FOR THE RED-TAILED HAWK - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Red-Tailed Hawk
(Average Inputs)

Body Weight	1.1340000 kg
Food Ingestion Rate	0.1120000 kg/day
Water Ingestion Rate	0.0646400 L/day
Soil Ingestion Rate	0.0031360 kg/day
Site Use Factor	0.1 (3.0 acre site/997 acre mean home range = 0.003)
Soil ing. rate based on red fox	

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.02	0.00	0.09	1.95E-03	4	4.4E-05
4,4'-DDE	0.02	0	0.00	0.00	0.09	2.26E-04	4	5.1E-06
4,4'-DDT	0.06	0	0.02	0.00	0.09	1.91E-03	4	4.3E-05
DDTR	0.14	0	0.29	0.00	0.09	3.19E-02	4	7.2E-04
Dieldrin	0.04	0	0.04	0.00	0.077	5.54E-03	0.2	2.1E-03
Heptachlor	0.04	0	0.07	0.00	NA	NA	1	NA
Heptachlor Epoxide	0.04	0	0.02	0.00	NA	NA	1	NA
Metals and Inorganic Compounds								
Chromium	8.27	0	0.22	0.00	1	4.50E-03	27370	1.6E-07
Lead	93.09	0	3.14	0.06	1.13	5.02E-02	80	7.1E-04
Zinc	43.93	0	10.85	0.12	14.5	8.23E-03	320	3.7E-04

NA - no NOAEL available

TABLE FCM-29

FOOD CHAIN MODEL FOR THE GRAY FOX - AVERAGE INPUTS
SITE 11: SOUTHEAST OPEN DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Gray Fox[1]								
(Average Inputs)								
Body Weight	4.5350000	kg						
Food Ingestion Rate	0.4288000	kg/day						
Water Ingestion Rate	0.3850000	L/day						
Soil Ingestion Rate	0.0120064	kg/day						
Site Use Factor	0.1	(3.0 acre site/1365 acre mean home range = 0.002)						
Mean Concentrations								
ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides and PCBs								
4,4'-DDD	0.06	0	0.02	0.0002	0.8	2.10E-04	4	4.2E-05
4,4'-DDE	0.02	0	0.00	0.0000	0.8	2.44E-05	4	4.9E-06
4,4'-DDT	0.06	0	0.02	0.0002	0.8	2.06E-04	4	4.1E-05
DDTR	0.14	0	0.29	0.0027	0.8	3.43E-03	4	6.9E-04
Dieldrin	0.04	0	0.04	0.0004	0.02	2.04E-02	0.2	2.0E-03
Heptachlor	0.04	0	0.07	0.0007	0.1	6.65E-03	1	6.7E-04
Heptachlor Epoxide	0.04	0	0.02	0.0002	0.1	1.87E-03	1	1.9E-04
Metals and Inorganic Compounds								
Chromium	8.27	0	0.22	0.0043	2737	1.57E-06	27370	1.6E-07
Lead	93.09	0	3.14	0.0543	8	6.79E-03	80	6.8E-04
Zinc	43.93	0	10.85	0.1142	160	7.14E-04	320	3.6E-04
[1] Based on values for the Red Fox in USEPA 1993								

TABLE FCM-30

HAZARD QUOTIENTS USING MEAN SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
SITE 11: SOUTHEAST DISPOSAL AREA B
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ
Pesticides												
4,4'-DDD	4.48E-04	8.97E-05	8.77E-02	1.75E-02	4.22E-04	9.50E-06	**1.69E+00**	3.81E-02	1.95E-03	4.39E-05	2.10E-04	4.21E-05
4,4'-DDE	1.83E-04	3.67E-05	3.51E-02	7.02E-03	1.70E-04	3.83E-06	6.78E-01	1.53E-02	2.26E-04	5.09E-06	2.44E-05	4.87E-06
4,4'-DDT	4.07E-04	8.14E-05	8.59E-02	1.72E-02	4.05E-04	9.12E-06	**1.66E+00**	3.73E-02	1.91E-03	4.30E-05	2.06E-04	4.12E-05
DDTR	9.89E-04	1.98E-04	2.09E-01	4.18E-02	9.85E-04	2.22E-05	**4.03E+00**	9.06E-02	3.19E-02	7.17E-04	3.43E-03	6.9E-04
Dieldrin	2.16E-02	2.16E-03	**1.41E+00**	1.41E-01	4.35E-04	1.68E-04	7.94E-01	3.06E-01	5.54E-03	2.13E-03	2.04E-02	2.0E-03
Heptachlor	5.22E-03	5.22E-04	4.09E-01	4.09E-02	NA	NA	NA	NA	NA	NA	6.65E-03	6.7E-04
Heptachlor Epoxide	2.68E-03	2.68E-04	1.26E-01	1.26E-02	NA	NA	NA	NA	NA	NA	1.87E-03	1.9E-04
Metals and Inorganic Compounds												
Chromium	2.62E-05	2.62E-06	2.57E-04	2.57E-05	6.06E-03	2.21E-07	**1.52E+00**	5.57E-05	4.50E-03	1.64E-07	1.57E-06	1.57E-07
Lead	9.89E-02	9.89E-03	9.47E-01	9.47E-02	5.99E-02	8.47E-04	**1.45E+01**	2.06E-01	5.02E-02	7.09E-04	6.79E-03	6.79E-04
Zinc	9.56E-03	4.78E-03	9.39E-02	4.69E-02	4.51E-03	2.04E-04	**2.25E+00**	1.02E-01	8.23E-03	3.73E-04	7.14E-04	3.57E-04

SITE 16

FCM CALCULATIONS

TABLE FCM-1

ESTIMATION OF MAXIMUM CONTAMINANT CONCENTRATIONS IN TERRESTRIAL PLANTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	PLANT BAF (ww)[1]	PLANT CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.018	3.30E-03	0.0001	RAIS - McKone, 1994.
4,4'-DDE	0.053	3.80E-03	0.0002	RAIS - McKone, 1994.
4,4'-DDT	0.028	1.60E-03	0.0000	RAIS - McKone, 1994.
DDTR	0.099	1.60E-03	0.0002	RAIS - McKone, 1994.
ALPHA-CHLORDANE	0.012	5.00E-03	0.0001	RAIS - McKone, 1994.
GAMMA-CHLORDANE	0.0079	5.00E-03	0.0000	RAIS - McKone, 1994.
DIELDRIN	0.060	1.70E-02	0.0010	RAIS - McKone, 1994.
AROCLOR-1254	0.130	2.50E-03	0.0003	RAIS - McKone, 1994.
AROCLOR-1260	0.110	5.90E-04	0.0001	RAIS - McKone, 1994.
TOTAL PCB	0.240	2.50E-03	0.0006	RAIS - McKone, 1994.
Metals and Inorganic Compounds				
ARSENIC	12.1	1.13E-02	0.14	ORNL 1998[2]
CADMIUM	7.6	1.76E-02	0.13	ORNL 1998[2]
CHROMIUM	29.2	1.23E-02	0.36	ORNL 1998[3]
COPPER	202	3.72E-02	7.51	ORNL 1998[2]
LEAD	759	1.17E-02	8.86	ORNL 1998[2]
MERCURY	0.65	1.96E-01	0.13	ORNL 1998[2]
SILVER	7.1	4.20E-03	0.03	ORNL 1998[3]
ZINC	773	1.10E-01	84.88	ORNL 1998[2]

[1] Used 70% water content for conversions, based on EPA (1993).
[2] Median transfer factors from Table 6, ORNL report BJC/OR-133 (ORNL,1998).
[3] Median transfer factor from Table D-1, ORNL report BJC/OR-133 (ORNL,1998).

RAIS - Oak Ridge National Laboratory Risk Assessment Information System Electronic Database (2004)

TABLE FCM-2

ESTIMATION OF MAXIMUM CONTAMINANT CONCENTRATIONS IN SOIL INVERTEBRATES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	INVERTEBRATE BAF[1] (dw/ww)	INVERTEBRATE CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.018	2.1	0.04	BAF from FCM-3
4,4'-DDE	0.053	2.1	0.11	BAF from FCM-3
4,4'-DDT	0.028	2.1	0.06	BAF from FCM-3
DDTR	0.099	2.1	0.21	BAF from FCM-3
ALPHA-CHLORDANE	0.012	0.8	0.01	BAF from FCM-3
GAMMA-CHLORDANE	0.008	0.8	0.01	BAF from FCM-3
DIELDRIN	0.060	1.06	0.06	BAF from FCM-3
AROCLOR-1254	0.130	1.07	0.14	Sample et al. 1998a[2]
AROCLOR-1260	0.110	1.07	0.12	Sample et al. 1998a[2]
TOTAL PCB	0.240	1.07	0.26	Sample et al. 1998a[2]
Metals and Inorganic Compounds				
ARSENIC	12.1	0.04	0.43	Sample et al. 1998a[2]
CADMIUM	7.6	1.23	9.37	Sample et al. 1998a[2]
CHROMIUM	29.2	0.05	1.43	Sample et al. 1998a[2]
COPPER	202	0.08	16.64	Sample et al. 1998a[2]
LEAD	759	0.04	32.64	Sample et al. 1998a[2]
MERCURY	0.65	0.27	0.18	Sample et al. 1998a[2]
SILVER	7.1	0.33	2.32	Sample et al. 1998a[3]
ZINC	773	0.51	395.78	Sample et al. 1998a[2]

[1]Used 84% water content for conversions, based on EPA (1993).
[2] Median transfer factor from Table 11, ORNL report ES/ER/TM-220 (Sample et al., 1998a).
[3] Median transfer factor from Table C.1, ORNL report ES/ER/TM-220 (Sample et al., 1998a).

TABLE FCM-3

EARTHWORM BAFS FOR PESTICIDES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	Study Values					Calculated Values			
	Worm Concentration		Soil	Dry	Wet	Final	Final		
Parameter	Dry Weight	Wet Weight	Conc. (dry weight)	Weight BAF	Weight BAF	Dry Weight[1] BAF	Wet Weight[2] BAF	Reference	Comments
DDT	NA	NA	NA	5	NA	5	0.80	1	soil type unknown (11-year field study)
	0.5	NA	1	0.5	NA	0.5	0.080	2	compost (lab)
	6.9	NA	4	1.7	NA	1.7	0.28	2	compost (lab)
	37	NA	16	2.3	NA	2.3	0.37	2	compost (lab)
	159	NA	64	2.5	NA	2.5	0.40	2	compost (lab)
	NA	NA	NA	9	NA	9.0	1.44	3	from data collected in 67 agricultural fields
	NA	NA	NA	NA	1.2-4.9	7.5-31	1.2-4.9	4	agricultural soil (0.94 ppm DDT in soil)
Average dry/wet weight BAF from field studies[3]				***NA***	***NA***	***13.0***	***2.1***		
Dieldrin	NA	NA	NA	8	NA	8	1.28	1	soil type unknown (11-year field study)
	NA	NA	NA	2.4	NA	2.4	0.38	2	compost (lab) (17 ppm dieldrin in compost)
	NA	NA	NA	5.6	NA	5.6	0.90	2	compost (lab) (17 ppm dieldrin in compost)
	NA	18.4	25	NA	0.74	4.6	0.7	5	compost (20-day lab study)
	NA	24.4	25	NA	0.98	6.1	1.0	5	compost (20-day lab study)
	NA	4.6	10	NA	0.46	2.9	0.5	6	90-day lab study
	NA	9.7	30	NA	0.32	2.0	0.3	6	90-day lab study
	NA	12.4	50	NA	0.25	1.6	0.2	6	90-day lab study
	NA	13.9	100	NA	0.14	0.87	0.1	6	90-day lab study
	NA	NA	NA	NA	0.97-4	6.16-25	0.97-4	4	agricultural soil (1.36 ppm total aldrin and dieldrin in soil)
Average dry/wet weight BAF from field studies[3]				***NA***	***NA***	***6.64***	***1.06***		
Average dry/wet weight BAF from field studies[3]				***NA***	***NA***	***10***	***1.6***		
Chlordane	NA	NA	NA	5	NA	5.0	0.8	3	from data collected in 7 agricultural fields

Notes:
BAF - bioaccumulation factor = worm concentration/soil concentration
NA - Not applicable
The percent solids of earthworms is assummed to be 0.16 [Sample et al., 1997])
1 - The calculated dry weight BAF was either obtained directly from the study or was calculated by dividing the wet weight BAF by 0.16
2 - The calculated wet weight BAF was either obtained directly from the study or was calculated by multiplying the dry weight BAF by 0.16
3 - The compost studies were not used in calculation of average BAF because the properties of the compost may be different than soil.
The compost studies were presented for informational purposes only.

References
1 - Beyer and Gish, 1980 and Beyer and Krynitsky, 1989
2 - Davis, 1971
3 - Gish, 1970
4 - Wheatly and Hardman, 1968
5 - Jeffries and Davis, 1968
6 - Venter and Reinecke, 1985

TABLE FCM-4

ESTIMATION OF MAXIMIMUM CONTAMINANT CONCENTRATIONS IN SMALL MAMMALS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN CHEMICAL OF CONCERN	MAXIMUM SITE SOIL CONCENTRATION (mg/kg-dw)	SMALL MAMMAL BAF[1] (dw/ww)	SMALL MAMMAL CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDD	0.018	0.134	0.01	BAF from FCM-5
4,4'-DDE	0.053	0.0294	0.003	BAF from FCM-5
4,4'-DDT	0.028	0.1344	0.01	BAF from FCM-5
DDTR	0.099	1	0.21	BAF from FCM-5
ALPHA-CHLORDANE	0.012	1	0.01	BAF from FCM-5
GAMMA-CHLORDANE	0.008	1	0.01	BAF from FCM-5
DIELDRIN	0.060	0.9091	0.06	BAF from FCM-5
AROCLOR-1254	0.130	4	0.52	BAF from FCM-6
AROCLOR-1260	0.110	4	0.44	BAF from FCM-6
TOTAL PCB	0.240	4	0.96	BAF from FCM-6
Metals and Inorganic Compounds				
ARSENIC	12.1	0.0008	0.01	Sample et al. 1998b[2]
CADMIUM	7.6	0.1067	0.81	Sample et al. 1998b[2]
CHROMIUM	29.2	0.0271	0.79	Sample et al. 1998b[2]
COPPER	202	0.0628	12.69	Sample et al. 1998b[2]
LEAD	759	0.0337	25.60	Sample et al. 1998b[2]
MERCURY	0.65	0.0174	0.01	Sample et al. 1998b[2]
SILVER	7.1	0.0013	0.01	Sample et al. 1998b[3]
ZINC	773	0.2469	190.89	Sample et al. 1998b[2]

[1]Used 68% water content for conversions, based on EPA (1993).
[2] Median transfer factor from Table 7, ORNL report ES/ER/TM-219 (Sample et al., 1998b).
[3] Median transfer factor from Table C.1, ORNL report ES/ER/TM-219 (Sample et al., 1998b).

TABLE FCM-5

SOIL/DIET TO MAMMAL BIOACCUMULATION FACTORS - PESTICIDES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Contaminants	Soil/Diet to Mammal Bioaccumulation Factors (BAFs)		
	(90%)	(median)	**Source**
Pesticides/ PCBs			
4,4'-DDD	0.25	0.1344	diet to biota [1]
4,4'-DDE	0.0372	0.0294	diet to biota [1]
4,4'-DDT	0.25	0.1344	diet to biota [1]
DDTR	1	1	NA
ALPHA-CHLORDANE	1	1	NA
GAMMA-CHLORDANE	1.4035	1	diet to biota [1]
DIELDRIN	1	0.9091	NA

1 - Value was developed as part of the Ecological Soil Screening Level (SSL) Guidance (EPA, November 2003)
The value in the 90% column is actually the maximum value from the Eco SSL guidance; the value in the median column is the median BAF from the Eco SSL guidance.

NA - none available, 1 is used as a default value

TABLE FCM-6

CALCULATION OF SOIL AND DIET TO SMALL MAMMAL UPTAKE FACTORS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Direct Soil to Mammal Bioaccumulation Factors[1]		Calculation of Soil to Mammal Bioaccumulation Factor					Source
	Wet Weight	Dry Weight	Soil to Worm[2]	Food to Mammal Wet Weight	Food to Mammal Dry Weight[1]	Overall Soil to Mammal WW [3]	Overall Soil to Mammal DW [3]	
PCBs	2.2	6.9						Boonstra and Bowman, 2003
	3.7	12						
	6.6	21						
Average		***13***						
Aroclor 1254			1.07	6.60	20.6	7.1	22	Clark and Prouty, 1977
Aroclor 1260			1.07	3.20	10.0	3.4	11	Clark, 1978
Aroclor 1254			1.07	0.66	2.1	0.7	2	McCoy et al., 1985
			1.07	1.50	4.7	1.6	5	
			1.07	2.9	9.1	3.1	10	
Average						***1.8***	***5.6***	
Average from three studies [4]						***4***	***13***	

1 - Converted to dry weight by dividing wet weight bioaccumulation factor by 0.32 (percent solids in small mammals).
2 - Converted bioaccumulation factor to wet weight by multiplying by 0.16 (percent soilds of earthworms) because food to mammal BAF was calculated assuming a wet-weight concentration in the food (Sample et al., 1998 for source of bioaccumulation factor).
3 - Calculated by multiplying the soil to worm bioaccumulation factor by the food to mammal bioaccumulation factor.
4 - Average of 22, 11, and 5.6 bioaccumulation factors.

TABLE FCM-6

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Volatile Organic Compounds									
1,2-Dichloroethene (total)	mouse	90 days	oral in water	body/organ wt,bl chem,liver func	452	NOAEL(10)	45.2	subchronic NOAEL/10	Palmer et al (1979) in ORNL (1996)
2-Butanone	rat	3 generations	oral in water	decreased fetal birth weight	3122	reported value	1771	reported value	Cox et al. (1975) in IRIS (2001)
Acetone	rat	90 days	oral intubation	liver and kidney damage	50	subchronic LOAEL/10	10	subchronic NOAEL/10	EPA (1986c) in ORNL (1996)
Benzene	mouse	days 6-12 of gestation	oral gavage	reproduction	263.6	reported value	26.36	LOAEL/10	Nawroot and Staples (1979) in ORNL (1996)
Bromoform	rat	13 weeks	oral gavage	hepatic lesions	35.7	reported value	17.9	reported value	NTP (1989) in IRIS (2001)
Carbon Disulfide	rat (NOAEL); rabbit (LOAEL)	critical lifestage	oral	fetal development	70	reported value	11	reported value	rat-Hardin et al ('81); rabbit- OHMTAD ('90) in Charters et al. ('96)
Methylene Chloride	rat	2 years	oral in water	liver histology	50	reported value	5.85	reported value	NCA (1982) in ORNL (1996)
Tetrachloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	1.4	subchronic NOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Toluene	mouse	days 6-12 of gestation	oral gavage	reproduction	260	reported value	26	LOAEL/10	Nawrot and Staples (1979) in ORNL (1996)
Trichloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	0.7	LOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Xylenes, Total	mouse	days 6-15 of gestation	oral gavage	reproduction	2.6	reported value	2.1	reported value	Marks et al. (1982) in ORNL (1996)
Semivolatile Organic Compounds									
2,4-Dinitrotoluene	rat	1 to 2 years	oral in diet	reproduction	0.6	reported value	0.06	LOAEL/10	Eillis et al. ('70); Lee et al. ('78,'85) in ATSDR (1997)
2-Methylnaphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(b)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(g,h,i)perylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(k)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Bis(2-Ethylhexyl)phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	11	NOAEL(10)	1.1	reported value	Peakall (1974) in ORNL (1996)
	mouse	105 days - critical lifestage	oral in diet	reproduction	183	reported value	18.3	reported value	Lamb et al. (1987) in ORNL (1996)
Butylbenzyl Phthalate	rat	6 months	oral in diet	organ toxicity	470	reported value	159	reported value	NTP (1985) in IRIS (2001)
Chrysene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Di-n-butyl phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	1.1	reported value	0.11	LOAEL/10	Peakall (1974) in ORNL (1996)
	mouse	105 day -critical lifestage	oral in diet	reproduction	1833	reported value	550	reported value	Lamb et al. (1987) in ORNL (1996)
Dibenzo(a,h)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Diethyl Phthalate	mouse	105 day -critical lifestage	oral in diet	reproduction	45830	NOAEL(10)	4583	reported value	Lamb et al. (1987) in ORNL (1996)
Fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Fluorene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Indeno(1,2,3-cd)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Naphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pentachlorophenol	rat	62 days - critical lifestage	oral in diet	reproduction	2.4	reported value	0.24	reported value	Schwetz et al. (1978) in ORNL (1996)
	Japanese quail	5 days	oral	mortality	68.5	subchronic LOAEL/10	6.85	LOAEL/10	Hill and Camardese (1986) in Sprenger et al. (1996)
Phenanthrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pesticides and PCBs									
4,4'-DDD	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDE	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975)
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDT	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996)
DDTR	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
Aldrin	rat	3 generations	oral in diet	reproduction	1	reported value	0.2	reported value	Treon and Cleveland (1955) in ORNL (1996)
Aroclor-1254	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996)
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996)
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich and Ringer (1977) in ORNL (1996)
Aroclor-1260	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996) - Aroclor 1254
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996) - Aroclor 1254
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich, Ringer (1977) in ORNL (1996) - Aroclor 1254
BHC,alpha	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,beta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,delta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,gamma (Lindane)	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
Chlordane,alpha	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Chlordane,gamma	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Dieldrin	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
DieldrinR	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
Endosulfan II	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endosulfan Sulfate	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endrin	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996)
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996)
Endrin Aldehyde	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Endrin Ketone	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Heptachlor	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996)

TABLE FCM-6

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Heptachlor Epoxide	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996) for heptachlor
Methoxychlor	rat	11 months - critical lifestage	oral in diet	reproduction	8	reported value	4	reported value	Gray et al. (1988) in ORNL (1996)
Metals and Inorganic Compounds									
Aluminum	ringed dove	4 months in critical lifestage	oral in diet	reproduction	1097	NOAEL(10)	109.7	reported value	Carriere et al. (1986) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	19.3	reported value	1.93	LOAEL/10	Ondreicka et al. (1966) in ORNL (1996)
Antimony	mouse	lifespan	oral in water	longevity	1.25	reported value	0.125	LOAEL/10	Schroeder et al. (1986b) in ORNL (1996)
Arsenic	male Brown-headed Cowbird	7 months	oral in diet	mortality	7.38	reported value	2.46	reported value	USFWS (1969) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	1.26	reported value	0.126	LOAEL/10	Schroeder and Mitchner (1971) in ORNL (1996)
Barium	1-day old chicks	4 weeks	oral in diet	mortality	417	reported value	208	reported value	Johnson et al. (1960) in ORNL (1996)
	rat	16 months	oral in water	growth, hypertension	51	NOAEL(10)	5.1	reported value	Perry et al. (1983) in ORNL (1996)
Beryllium	rat	lifetime	oral in diet	longevity, wieght loss	6.6	NOAEL(10)	0.66	reported value	Schroeder and Mitchner (1975) in ORNL (1996)
Boron	rat	3 generations	oral in diet	reproduction	93.6	reported value	28	reported value	Weir and Fisher (1972) in ORNL (1996)
	Mallard Ducks	gestation, incl. 3 wks prior & post	oral in diet	reproduction	100	reported value	28.8	reported value	Smith and Anders (1989) in ORNL (1996)
Cadmium	Mallard Ducks	90 days - critical lifestage	oral in diet	reproduction	20	reported value	1.45	reported value	White and Finley (1978) in ORNL (1996)
	rat	6 weeks mating/gestation	oral gavage	reproduction	10	reported value	1	reported value	Sutou et al. (1980b) in ORNL (1996)
Chromium, trivalent	Black duck	10 months - critical lifestage	oral in diet	reproduction	5	reported value	1	reported value	Haseltine et al. (unpubl. data) in ORNL (1996)
	rat	90 day and 2 year	oral in diet	longevity, reproduction	27370	NOAEL(10)	2737	reported value	Ivankovic and Preussmann (1975) in ORNL (1996)
Chromium, hexavalent	rat	1 year	oral in water	body wt,food consumption	--	--	3.28	reported value	MacKenzie et al. (1958) in ORNL (1996)
	rat	3 months	oral in water	mortality	13.14	subchronic LOAEL/10	---	---	Steven et al. (1976) in ORNL (1996)
Cobalt	chicken	unknown	oral in diet	appetite, weight	3.1	reported value	0.31	LOAEL/10	NRC (1977) in HSDB (2001)
	rat (weanling)	3.5 months	oral in milk	mortality	1.4	reported value	0.14	LOAEL/10	Patty's Ind. Hygiene (1982) in HSDB (2001)
Copper	1-day old chicks	10 weeks	oral in diet	growth, mortality	61.7	reported value	47	reported value	Mehring et al. (1960) in ORNL (1996)
	mink	357 days- critical lifestage	oral in diet	reproduction	15.4	reported value	11.7	reported value	Aulerich et al. (1982) in ORNL (1996)
Cyanide	rat	gestation and lactation	oral in diet	reproduction	687	NOAEL(10)	68.7	reported value	Tewe and Maner (1981) in ORNL (1996)
Lead	Japanese quail	12 weeks - critical lifestage	oral in diet	reproduction	11.3	reported value	1.13	reported value	Edens et al. (1976) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	8	reported value	Azar et al. (1973) in ORNL (1996)
Iron									
Manganese	Japanese quail - males	75 days	oral in diet	growth,agressiveness	9970	NOAEL(10)	997	reported value	Laskey and Edens (1985) in ORNL (1996)
	rat	through gestation for 224 days	oral in diet	reproduction	284	reported value	88	reported value	Laskey et al. (1982) in ORNL (1996)
Mercury, inorganic	Japanese quail	1 year	oral in diet	reproduction	0.9	reported value	0.45	reported value	Hill and Schaffner (1976) in ORNL (1996)
	mink	6 months - critical lifestage	oral in diet	reproduction	10	NOAEL(10)	1	reported value	Aulerich et al. (1974) in ORNL (1996)
Mercury, methyl	Mallard Ducks	3 generations	oral in diet	reproduction	0.064	reported value	0.0064	LOAEL/10	Heinz (1979) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.16	reported value	0.032	reported value	Verschuuren et al. (1976) in ORNL (1996)
Nickel	juvenile Mallard Ducks	90 days	oral in diet	mortality, growth, behavior	107	reported value	77.4	reported value	Cain and Pafford (1981) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	40	reported value	Ambrose et al. (1976) in ORNL (1996)
Selenium	Mallard Ducks	78 days	oral in diet	reproduction	1	reported value	0.5	reported value	Heinz et al. (1987) in ORNL (1996)
	rat	one year - 2 generations	oral in water	reproduction	0.33	reported value	0.2	reported value	Rosenfeld and Beath (1954) in ORNL (1996)
Silver	mice	125 days	oral in water	hypoactivity	24	reported value	2.4	LOAEL/10	Rungby and Danscher (1984)
Thallium	rat	60 days	oral in water	reproduction	0.074	subchronic LOAEL/10	0.0074	LOAEL/10	Formigli et al. (1986) in ORNL (1996)
Vanadium	Mallard Ducks	12 weeks	oral in diet	mortality, body wt, blood chem	113.8	NOAEL(10)	11.38	reported value	White and Dieter (1978) in ORNL (1996)
	rat	60 days -critical lifestage	oral intubation	reproduction	2.1	reported value	0.21	LOAEL/10	Domingo et al. (1986) in ORNL (1996)
Zinc	White Leghorn Hens	44 weeks	oral in diet	reproduction	131	reported value	14.5	reported value	Stahl et al. (1990) in ORNL (1996)
	rat	days 1-16 of gestation	oral in diet	reproduction	320	reported value	160	reported value	Schlicker and Cox (1968) in ORNL (1996)

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	NOAELs in mg/kg/day	
Chemical	**Bird**	**Mammal**
Volatile Organic Compounds		
1,1-Dichloroethane		
1,2-Dichloroethene (total)		45.2
1,1,2,2-Tetrachloroethane		
2-Butanone		1771
Acetone		10
Benzene		26.36
Bromoform		17.9
Carbon Disulfide		11
Chloroform		
Dibromochloromethane		
Ethylbenzene		
Methylene Chloride		5.85
Styrene		
Tetrachloroethene		1.4
Toluene		26
Trichloroethane		
Trichloroethene		0.7
Xylenes, Total		2.1
Semivolatile Organic Compounds		
2,4-Dinitrotoluene		0.06
2-Methylnaphthalene	2	1
4-Methylphenol		
Acenaphthene	2	1
Acenaphthylene	2	1
Anthracene	2	1
Benzo(a)anthracene	2	1
Benzo(a)pyrene	2	1
Benzo(b)fluoranthene	2	1
Benzo(g,h,i)perylene	2	1
Benzo(k)fluoranthene	2	1
Bis(2-Ethylhexyl)phthalate	1.1	18.3
Butylbenzyl Phthalate		159
Carbazole		
Chrysene	2	1
Di-n-butyl phthalate	0.11	550
Di-n-octyl phthalate		
Dibenzo(a,h)anthracene	2	1
Dibenzofuran		
Diethyl Phthalate		4583
Fluoranthene	2	1
Fluorene	2	1
Hexachlorocyclopentadiene		
Indeno(1,2,3-cd)pyrene	2	1

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Bird	Mammal
N-Nitrosodiphenylamine		
Naphthalene	2	1
Pentachlorophenol	6.85	0.24
Phenanthrene	2	1
Pyrene	2	1
Miscellaneous Compounds		
Phenols		
Pesticides and PCBs		
4,4'-DDD	0.09	0.8
4,4'-DDE	0.09	0.8
4,4'-DDT	0.09	0.8
DDTR	0.09	0.8
Aldrin		0.2
Aroclor-1254	0.18	0.068
Aroclor-1260	0.18	0.068
Alpha-BHC	0.56	0.014
Beta-BHC	0.56	0.014
BHC,alpha	0.56	0.014
BHC,beta	0.56	0.014
BHC,delta	0.56	0.014
BHC,gamma (Lindane)	0.56	0.014
Alpha-Chlordane	2.14	4.6
Gamma-Chlordane	2.14	4.6
Dieldrin	0.077	0.02
Endosulfan II	10	0.15
Endosulfan Sulfate	10	0.15
Endrin	0.01	0.092
Endrin Aldehyde	0.01	0.092
Endrin Ketone	0.01	0.092
Fenuron Tca		
Gamma-BHC (Lindane)	0.56	0.014
Heptachlor		0.1
Heptachlor Epoxide		0.1
Methoxychlor		4
Monuron		
Metals and Inorganic Compounds		
Aluminum	109.7	1.93
Antimony		0.125
Arsenic	2.46	0.126
Barium	208	5.1
Beryllium		0.66
Boron	28.8	28
Cadmium	1.45	1
Calcium		
Chromium	1	2737

TABLE FCM-7

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Bird	Mammal
Chromium, trivalent	1	2737
Chromium, hexavalent		3.28
Cobalt	0.31	0.14
Copper	47	11.7
Cyanide		68.7
Iron		
Lead	1.13	8
Magnesium		
Manganese	997	88
Mercury	0.0064	0.032
Mercury, Low Level	0.0064	0.032
Mercury, inorganic	0.45	1
Mercury, methyl	0.0064	0.032
Nickel	77.4	40
Potassium		
Selenium	0.5	0.2
Silver		2.4
Sodium		
Thallium		0.0074
Vanadium	11.38	0.21
Zinc	14.5	160

TABLE FCM-8

EXPOSURE CONCENTRATIONS FOR ECOLOGICAL RECEPTORS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL RECEPTOR MODELS					
	Surface Soil	Surface Water	Plant	Invertebrate	Small Mammal
	Maximum	Maximum	Maximum	Maximum	Maximum
Chemical	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
Pesticides PCBs (ug/kg)					
4,4'-DDD	0.018	0	0.0001	0.04	0.01
4,4'-DDE	0.053	0	0.0002	0.11	0.00
4,4'-DDT	0.028	0	0.0000	0.06	0.01
DDTR	0.099	0	0.0002	0.21	0.21
ALPHA-CHLORDANE	0.012	0	0.0001	0.01	0.01
GAMMA-CHLORDANE	0.008	0	0.0000	0.01	0.01
DIELDRIN	0.060	0	0.0010	0.06	0.06
AROCLOR-1254	0.130	0	0.0003	0.14	0.52
AROCLOR-1260	0.110	0	0.0001	0.12	0.44
TOTAL PCB	0.240	0	0.0006	0.26	0.96
Metals and Inorganic Compounds					
ARSENIC	12.1	0	0.14	0.43	0.01
CADMIUM	7.6	0	0.13	9.37	0.81
CHROMIUM	29.2	0	0.36	1.43	0.79
COPPER	202	0	7.51	16.64	12.69
LEAD	759	0	8.86	32.64	25.60
MERCURY	0.65	0	0.13	0.18	0.01
SILVER	7.1	0	0.03	2.32	0.01
ZINC	773	0	84.88	395.78	190.89

TABLE FCM-9

FOOD CHAIN MODEL FOR THE COTTON MOUSE - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Cotton Mouse[1]
(Conservative Inputs)

Body Weight	0.0148000 kg
Food Ingestion Rate	0.0092685 kg/day
Water Ingestion Rate	0.0059850 L/day
Soil Ingestion Rate	0.0001854 kg/day

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.00	0.00	0.8	3.28E-04
4,4'-DDE	0.053	0	0.00	0.00	0.8	9.87E-04
4,4'-DDT	0.028	0	0.00	0.00	0.8	4.73E-04
DDTR	0.099	0	0.00	0.00	0.8	1.67E-03
ALPHA-CHLORDANE	0.012	0	0.00	0.00	4.6	4.08E-05
GAMMA-CHLORDANE	0.008	0	0.00	0.00	4.6	2.69E-05
DIELDRIN	0.060	0	0.00	0.00	0.02	6.95E-02
AROCLOR-1254	0.130	0	0.00	0.00	0.068	2.69E-02
AROCLOR-1260	0.110	0	0.00	0.00	0.068	2.09E-02
TOTAL PCB	0.240	0	0.00	0.00	0.068	
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.14	0.23680078	0.126	**1.88E+00**
CADMIUM	7.6	0	0.13	0.17886201	1	1.79E-01
CHROMIUM	29.2	0	0.36	0.59	2737	2.16E-04
COPPER	202	0	7.51	7.24	11.7	6.18E-01
LEAD	759	0	8.86	15.05	8	**1.88E+00**
MERCURY	0.65	0	0.13	0.09	0.032	**2.74E+00**
SILVER	7.1	0	0.03	0.11	2.4	4.48E-02
ZINC	773	0	84.88	62.84	160	3.93E-01

TABLE FCM-10

FOOD CHAIN MODEL FOR THE SHORT-TAILED SHREW - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Short-Tailed Shrew
(Conservative Inputs)

Body Weight	0.0150000 kg
Food Ingestion Rate	0.0100000 kg/day
Water Ingestion Rate	0.0042838 L/day
Soil Ingestion Rate	0.0010400 kg/day

Soil ing. rate based on woodcock

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.04	0.03	0.8	3.31E-02
4,4'-DDE	0.053	0	0.11	0.08	0.8	9.73E-02
4,4'-DDT	0.028	0	0.06	0.04	0.8	5.14E-02
DDTR	0.099	0	0.21	0.15	0.8	1.82E-01
ALPHA-CHLORDANE	0.012	0	0.01	0.01	4.6	1.57E-03
GAMMA-CHLORDANE	0.008	0	0.01	0.01	4.6	1.33E-03
DIELDRIN	0.060	0	0.06	0.05	0.02	**2.33E+00**
AROCLOR-1254	0.130	0	0.14	0.10	0.068	**1.49E+00**
AROCLOR-1260	0.110	0	0.12	0.09	0.068	**1.26E+00**
TOTAL PCB	0.240	0	0.26	0.19	0.068	**2.75E+00**
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.43	1.13	0.126	**8.95E+00**
CADMIUM	7.6	0	9.37	6.78	1	**6.78E+00**
CHROMIUM	29.2	0	1.43	2.98	2737	1.09E-03
COPPER	202	0	16.64	25.10	11.7	**2.15E+00**
LEAD	759	0	32.64	74.38	8	**9.30E+00**
MERCURY	0.65	0	0.18	0.16	0.032	**5.08E+00**
SILVER	7.1	0	2.32	2.04	2.4	8.50E-01
ZINC	773	0	395.78	317.45	160	**1.98E+00**

TABLE FCM-11

FOOD CHAIN MODEL FOR THE COMMON BOBWHITE - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Common Bobwhite
(Conservative Inputs)

Body Weight	0.1540000 kg
Food Ingestion Rate	0.0163000 kg/day
Water Ingestion Rate	0.0228000 L/day
Soil Ingestion Rate	0.0013366 kg/day
Soil ing. rate based on Canada goose	

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.0	0.00	0.09	1.81E-03
4,4'-DDE	0.053	0	0.0	0.00	0.09	5.35E-03
4,4'-DDT	0.028	0	0.0	0.00	0.09	2.75E-03
DDTR	0.099	0	0.0	0.00	0.09	9.73E-03
ALPHA-CHLORDANE	0.012	0	0.0	0.00	2.14	5.16E-05
GAMMA-CHLORDANE	0.0079	0	0.0	0.00	2.14	3.40E-05
DIELDRIN	0.06	0	0.0	0.00	0.077	8.17E-03
AROCLOR-1254	0.13	0	0.0	0.00	0.18	6.46E-03
AROCLOR-1260	0.11	0	0.0	0.00	0.18	5.34E-03
TOTAL PCB	0.24	0	0.0	0.00	0.18	1.19E-02
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.1	0.12	2.46	4.85E-02
CADMIUM	7.6	0	0.1	0.08	1.45	5.52E-02
CHROMIUM	29.2	0	0.4	0.29	1	2.91E-01
COPPER	202	0	7.5	2.55	47	5.42E-02
LEAD	759	0	8.9	7.53	1.13	**6.66E+00**
MERCURY	0.65	0	0.1	0.02	0.0064	**2.98E+00**
SILVER	7.1	0	0.0	0.06	NA	NA
ZINC	773	0	84.9	15.69	14.5	**1.08E+00**

TABLE FCM-12

FOOD CHAIN MODEL FOR THE AMERICAN ROBIN - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

American Robin
(Conservative Inputs)

Body Weight	0.0773000 kg
Food Ingestion Rate	0.1222080 kg/day
Water Ingestion Rate	0.0120680 L/day
Soil Ingestion Rate	0.0127096 kg/day

Soil ing. rate based on woodcock

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.04	0.06	0.09	6.97E-01
4,4'-DDE	0.053	0	0.11	0.18	0.09	**2.05E+00**
4,4'-DDT	0.028	0	0.06	0.10	0.09	**1.08E+00**
DDTR	0.099	0	0.21	0.34	0.09	**3.83E+00**
ALPHA-CHLORDANE	0.012	0	0.01	0.02	2.14	8.01E-03
GAMMA-CHLORDANE	0.0079	0	0.01	0.01	2.14	6.79E-03
DIELDRIN	0.06	0	0.06	0.11	0.077	**1.43E+00**
AROCLOR-1254	0.13	0	0.14	0.24	0.18	**1.34E+00**
AROCLOR-1260	0.11	0	0.12	0.20	0.18	**1.13E+00**
TOTAL PCB	0.24	0	0.26	0.44	0.18	**2.47E+00**
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.43	2.68	2.46	**1.09E+00**
CADMIUM	7.6	0	9.37	16.07	1.45	**1.11E+01**
CHROMIUM	29.2	0	1.43	7.06	1	**7.06E+00**
COPPER	202	0	16.64	59.53	47	**1.27E+00**
LEAD	759	0	32.64	176.39	1.13	**1.56E+02**
MERCURY	0.65	0	0.18	0.39	0.0064	**6.02E+01**
SILVER	7.1	0	2.32	4.84	NA	NA
ZINC	773	0	395.78	752.80	14.5	**5.19E+01**

TABLE FCM-13

FOOD CHAIN MODEL FOR THE RED-TAILED HAWK - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Red-Tailed Hawk
(Conservative Inputs)

Body Weight	0.9570000 kg
Food Ingestion Rate	0.1250000 kg/day
Water Ingestion Rate	0.0669000 L/day
Soil Ingestion Rate	0.0035000 kg/day
Soil ing. rate based on red fox	

Maximum Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.01	0.0007294	0.09	8.10E-03
4,4'-DDE	0.053	0	0.00	0.00062124	0.09	6.90E-03
4,4'-DDT	0.028	0	0.01	0.00113463	0.09	1.26E-02
DDTR	0.099	0	0.21	0.02751724	0.09	3.06E-01
ALPHA-CHLORDANE	0.012	0	0.01	0.00129781	2.14	6.06E-04
GAMMA-CHLORDANE	0.0079	0	0.01	0.00112268	2.14	5.25E-04
DIELDRIN	0.06	0	0.06	0.00777152	0.077	1.01E-01
AROCLOR-1254	0.13	0	0.52	0.06839603	0.18	3.80E-01
AROCLOR-1260	0.11	0	0.44	0.05787356	0.18	3.22E-01
TOTAL PCB	0.24	0	0.96	0.12626959	0.18	7.01E-01
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.01	0.04551724	2.46	1.85E-02
CADMIUM	7.6	0	0.81	0.13367106	1.45	9.22E-02
CHROMIUM	29.2	0	0.79	0.21004472	1	2.10E-01
COPPER	202	0	12.69	2.39613793	47	5.10E-02
LEAD	759	0	25.60	6.11958621	1.13	**5.42E+00**
MERCURY	0.65	0	0.01	0.00385246	0.0064	6.02E-01
SILVER	7.1	0	0.01	0.02715361	NA	NA
ZINC	773	0	190.89	27.7601505	14.5	**1.91E+00**

TABLE FCM-14

FOOD CHAIN MODEL FOR THE GRAY FOX - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Gray Fox[1]						
Body Weight	3.9400000	kg				
Food Ingestion Rate	0.6349000	kg/day				
Water Ingestion Rate	0.3900100	L/day				
Soil Ingestion Rate	0.0177772	kg/day				
Maximum Concentrations						
	Soil	Water	Small Mammal			
	Concentration	Concentration	Concentration	Dose	NOAEL	NOAEL
ECOC	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg/day)	(mg/kg/day)	HQ
Pesticides PCBs (ug/kg)						
4,4'-DDD	0.018	0	0.01	0.00	0.8	1.12E-03
4,4'-DDE	0.053	0	0.00	0.00	0.8	9.58E-04
4,4'-DDT	0.028	0	0.01	0.00	0.8	1.75E-03
DDTR	0.099	0	0.21	0.03	0.8	4.24E-02
ALPHA-CHLORDANE	0.012	0	0.01	0.00	4.6	3.48E-04
GAMMA-CHLORDANE	0.0079	0	0.01	0.00	4.6	3.01E-04
DIELDRIN	0.06	0	0.06	0.01	0.02	4.79E-01
AROCLOR-1254	0.13	0	0.52	0.08	0.068	**1.24E+00**
AROCLOR-1260	0.11	0	0.44	0.07	0.068	**1.05E+00**
TOTAL PCB	0.24	0	0.96	0.16	0.068	**2.29E+00**
Metals and Inorganic Compounds						
ARSENIC	12.1	0	0.01	0.06	0.126	4.46E-01
CADMIUM	7.6	0	0.81	0.16	1	1.65E-01
CHROMIUM	29.2	0	0.79	0.26	2737	9.47E-05
COPPER	202	0	12.69	2.96	11.7	2.53E-01
LEAD	759	0	25.60	7.55	8	9.44E-01
MERCURY	0.65	0	0.01	0.00	0.032	1.49E-01
SILVER	7.1	0	0.01	0.03	2.4	1.40E-02
ZINC	773	0	190.89	34.25	160	2.14E-01
[1] Based on values for the Red Fox in USEPA 1993						

TABLE FCM-15

HAZARD QUOTIENTS USING MAXIMUM SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - CONSERVATIVE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Ecological Contaminant of Concern	Cotton Mouse NOAEL HQ	Shrew NOAEL HQ	Bobwhite NOAEL HQ	Robin NOAEL HQ	Hawk NOAEL HQ	Fox NOAEL HQ
Pesticides and PCBs						
4,4'-DDD	3.28E-04	3.31E-02	1.81E-03	6.97E-01	8.10E-03	1.12E-03
4,4'-DDE	9.87E-04	9.73E-02	5.35E-03	**2.05E+00**	6.90E-03	9.58E-04
4,4'-DDT	4.73E-04	5.14E-02	2.75E-03	**1.08E+00**	1.26E-02	1.75E-03
DDTR	1.67E-03	1.82E-01	9.73E-03	**3.83E+00**	3.06E-01	4.24E-02
ALPHA-CHLORDANE	4.08E-05	1.57E-03	5.16E-05	8.01E-03	6.06E-04	3.48E-04
GAMMA-CHLORDANE	2.69E-05	1.33E-03	3.40E-05	6.79E-03	5.25E-04	3.01E-04
DIELDRIN	6.95E-02	**2.33E+00**	8.17E-03	**1.43E+00**	1.01E-01	4.79E-01
AROCLOR-1254	2.69E-02	**1.49E+00**	6.46E-03	**1.34E+00**	3.80E-01	**1.24E+00**
AROCLOR-1260	2.09E-02	**1.26E+00**	5.34E-03	**1.13E+00**	3.22E-01	**1.05E+00**
TOTAL PCB	0.00E+00	**2.75E+00**	1.19E-02	**2.47E+00**	7.01E-01	**2.29E+00**
Metals and Inorganic Compounds						
ARSENIC	**1.88E+00**	**8.95E+00**	4.85E-02	**1.09E+00**	1.85E-02	4.46E-01
CADMIUM	1.79E-01	**6.78E+00**	5.52E-02	**1.11E+01**	9.22E-02	1.65E-01
CHROMIUM	2.16E-04	1.09E-03	2.91E-01	**7.06E+00**	2.10E-01	9.47E-05
COPPER	6.18E-01	**2.15E+00**	5.42E-02	**1.27E+00**	5.10E-02	2.53E-01
LEAD	**1.88E+00**	**9.30E+00**	**6.66E+00**	**1.56E+02**	**5.42E+00**	9.44E-01
MERCURY	**2.74E+00**	**5.08E+00**	**2.98E+00**	**6.02E+01**	6.02E-01	1.49E-01
SILVER	4.48E-02	8.50E-01	NA	NA	NA	1.40E-02
ZINC	3.93E-01	**1.98E+00**	**1.08E+00**	**5.19E+01**	**1.91E+00**	2.14E-01

TABLE FCM-16

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN TERRESTRIAL PLANTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	PLANT BAF (dw/ww)[1]	PLANT CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDE	0.011	3.80E-03	0.00004	RAIS - McKone, 1994.
4,4'-DDT	0.007	1.60E-03	0.00001	RAIS - McKone, 1994.
DDTR	0.017	1.60E-03	0.00003	RAIS - McKone, 1994.
DIELDRIN	0.009	1.70E-02	0.00015	RAIS - McKone, 1994.
AROCLOR-1254	0.043	2.50E-03	0.00011	RAIS - McKone, 1994.
AROCLOR-1260	0.039	5.90E-04	0.00002	RAIS - McKone, 1994.
TOTAL PCB	0.082	2.50E-03	0.00021	RAIS - McKone, 1994.
Metals and Inorganic Compounds				
ARSENIC	2.82	1.13E-02	0.03	ORNL 1998[2]
CADMIUM	1.14	1.76E-02	0.02	ORNL 1998[2]
CHROMIUM	10.50	1.23E-02	0.13	ORNL 1998[3]
COPPER	30.47	3.72E-02	1.13	ORNL 1998[2]
LEAD	103.33	1.17E-02	1.21	ORNL 1998[2]
MERCURY	0.10	1.96E-01	0.02	ORNL 1998[2]
SILVER	1.46	4.20E-03	0.01	ORNL 1998[3]
ZINC	101.28	1.10E-01	11.12	ORNL 1998[2]

[1] Used 70% water content for conversions, based on EPA (1993).

[2] Median transfer factors from Table 6, ORNL report BJC/OR-133 (ORNL,1998).

[3] Median transfer factor from Table D-1, ORNL report BJC/OR-133 (ORNL,1998).

RAIS - Oak Ridge National Laboratory Risk Assessment Information System Electronic Database (2004)

TABLE FCM-17

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN SOIL INVERTEBRATES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN PRELIMINARY CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	INVERTEBRATE BAF[1] (dw/ww)	INVERTEBRATE CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDE	0.011	2.1	0.02	BAF from FCM-3
4,4'-DDT	0.007	2.1	0.01	BAF from FCM-3
DDTR	0.017	2.1	0.04	BAF from FCM-3
DIELDRIN	0.009	1.06	0.01	BAF from FCM-3
AROCLOR-1254	0.043	1.07	0.05	Sample et al. 1998a[2]
AROCLOR-1260	0.039	1.07	0.04	Sample et al. 1998a[2]
TOTAL PCB	0.082	1.07	0.09	Sample et al. 1998a[2]
Metals and Inorganic Compounds				
ARSENIC	2.82	0.04	0.10	Sample et al. 1998a[2]
CADMIUM	1.14	1.23	1.40	Sample et al. 1998a[2]
CHROMIUM	10.50	0.05	0.51	Sample et al. 1998a[2]
COPPER	30.47	0.08	2.51	Sample et al. 1998a[2]
LEAD	103.33	0.04	4.44	Sample et al. 1998a[2]
MERCURY	0.10	0.27	0.03	Sample et al. 1998a[2]
SILVER	1.46	0.33	0.48	Sample et al. 1998a[3]
ZINC	101.28	0.51	51.86	Sample et al. 1998a[2]

[1] Used 84% water content for conversions, based on EPA (1993).

[2] Median transfer factor from Table 11, ORNL report ES/ER/TM-220 (Sample et al., 1998a).

[3] Median transfer factor from Table C.1, ORNL report ES/ER/TM-220 (Sample et al., 1998a).

TABEL FCM-18

EARTHWORM BAFS FOR PESTICIDES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Study Values					Calculated Values		Reference	Comments
	Worm Concentration		Soil Conc. (dry weight)	Dry Weight BAF	Wet Weight BAF	Final Dry Weight(1) BAF	Final Wet Weight(2) BAF		
	Dry Weight	Wet Weight							
DDT	NA	NA	NA	5	NA	5	0.80	1	soil type unknown (11-year field study)
	0.5	NA	1	0.5	NA	0.5	0.080	2	compost (lab)
	6.9	NA	4	1.7	NA	1.7	0.28	2	compost (lab)
	37	NA	16	2.3	NA	2.3	0.37	2	compost (lab)
	159	NA	64	2.5	NA	2.5	0.40	2	compost (lab)
	NA	NA	NA	9	NA	9.0	1.44	3	from data collected in 67 agricultural fields
	NA	NA	NA	NA	1.2-4.9	7.5-31	1.2-4.9	4	agricultural soil (0.94 ppm DDT in soil)
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***13.0***	***2.1***		
Dieldrin	NA	NA	NA	8	NA	8	1.28	1	soil type unknown (11-year field study)
	NA	NA	NA	2.4	NA	2.4	0.38	2	compost (lab) (17 ppm dieldrin in compost)
	NA	NA	NA	5.6	NA	5.6	0.90	2	compost (lab) (17 ppm dieldrin in compost)
	NA	18.4	25	NA	0.74	4.6	0.7	5	compost (20-day lab study)
	NA	24.4	25	NA	0.98	6.1	1.0	5	compost (20-day lab study)
	NA	4.6	10	NA	0.46	2.9	0.5	6	90-day lab study
	NA	9.7	30	NA	0.32	2.0	0.3	6	90-day lab study
	NA	12.4	50	NA	0.25	1.6	0.2	6	90-day lab study
	NA	13.9	100	NA	0.14	0.87	0.1	6	90-day lab study
	NA	NA	NA	NA	0.97-4	6.16-25	0.97-4	4	agricultural soil (1.36 ppm total aldrin and dieldrin in soil)
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***6.64***	***1.06***		
Average dry/wet weight BAF from field studies (3)				***NA***	***NA***	***10***	***1.6***		

Notes:
BAF - bioaccumulation factor = worm concentration/soil concentration
NA - Not applicable
The percent solids of earthworms is assummed to be 0.16 [Sample et al., 1997])
1 - The calculated dry weight BAF was either obtained directly from the study or was calculated by dividing the wet weight BAF by 0.16
2 - The calculated wet weight BAF was either obtained directly from the study or was calculated by multiplying the dry weight BAF by 0.16
3 - The compost studies were not used in calculation of average BAF because the properties of the compost may be different than soil.
The compost studies were presented for informational purposes only.

References
1 - Beyer and Gish, 1980 and Beyer and Krynitsky, 1989
2 - Davis, 1971
3 - Gish, 1970
4 - Wheatly and Hardman, 1968
5 - Jeffries and Davis, 1968
6 - Venter and Reinecke, 1985

TABLE FCM-19

ESTIMATION OF MEAN CONTAMINANT CONCENTRATIONS IN SMALL MAMMALS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL FOOD CHAIN CHEMICAL OF CONCERN	MEAN SITE SOIL CONCENTRATION (mg/kg-dw)	SMALL MAMMAL BAF[1] (dw/ww)	SMALL MAMMAL CONCENTRATION (mg/kg-ww)	NOTES
Pesticides PCBs (ug/kg)				
4,4'-DDE	0.011	0.0294	0.001	BAF from FCM-5
4,4'-DDT	0.007	0.1344	0.002	BAF from FCM-5
DDTR	0.017	1	0.036	BAF from FCM-5
DIELDRIN	0.009	0.9091	0.008	BAF from FCM-5
AROCLOR-1254	0.043	4	0.172	BAF from FCM-6
AROCLOR-1260	0.039	4	0.156	BAF from FCM-6
TOTAL PCB	0.082	4	0.328	BAF from FCM-6
Metals and Inorganic Compounds				
ARSENIC	2.82	0.0008	0.002	Sample et al. 1998b[2]
CADMIUM	1.14	0.1067	0.12	Sample et al. 1998b[2]
CHROMIUM	10.50	0.0271	0.28	Sample et al. 1998b[2]
COPPER	30.47	0.0628	1.91	Sample et al. 1998b[2]
LEAD	103.33	0.0337	3.48	Sample et al. 1998b[2]
MERCURY	0.10	0.0174	0.002	Sample et al. 1998b[2]
SILVER	1.46	0.0013	0.002	Sample et al. 1998b[3]
ZINC	101.28	0.2469	25.01	Sample et al. 1998b[2]

[1] Used 68% water content for conversions, based on EPA (1993).
[2] Median transfer factor from Table 7, ORNL report ES/ER/TM-219 (Sample et al., 1998b).
[3] Median transfer factor from Table C.1, ORNL report ES/ER/TM-219 (Sample et al., 1998b).

TABLE FCM-20
SOIL/DIET TO MAMMAL BIOACCUMULATION FACTORS - PESTICIDES
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Contaminants	Soil/Diet to Mammal Bioaccumulation Factors (BAFs)		
	(90%)	(median)	**Source**
Pesticides/ PCBs			
4,4'-DDE	0.0372	0.0294	diet to biota [1]
4,4'-DDT	0.25	0.1344	diet to biota [1]
DDTR	1	1	NA
DIELDRIN	1	0.9091	NA

1 - Value was developed as part of the Ecological Soil Screening Level (SSL) Guidance (EPA, November 2003) The value in the 90% column is actually the maximum value from the Eco SSL guidance; the value in the median column is the median BAF from the Eco SSL guidance.

NA - none available, 1 is used as a default value

TABLE FCM-21

CALCULATION OF SOIL AND DIET TO SMALL MAMMAL UPTAKE FACTORS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Parameter	Direct Soil to Mammal Bioaccumulation Factors(1)		Calculation of Soil to Mammal Bioaccumulation Factor					Source
	Wet Weight	Dry Weight	Soil to Worm(2)	Food to Mammal Wet Weight	Food to Mammal Dry Weight(1)	Overall Soil to Mammal WW (3)	Overall Soil to Mammal DW (3)	
PCBs	2.2	6.9						Boonstra and Bowman, 2003
	3.7	12						
	6.6	21						
Average		***13***						
Aroclor 1254			1.07	6.60	20.6	7.1	22	Clark and Prouty, 1977
Aroclor 1260			1.07	3.20	10.0	3.4	11	Clark, 1978
Aroclor 1254			1.07	0.66	2.1	0.7	2	McCoy et al., 1985
			1.07	1.50	4.7	1.6	5	
			1.07	2.9	9.1	3.1	10	
Average						***1.8***	***5.6***	
Average from three studies (4)						***4***	***13***	

1 - Converted to dry weight by dividing wet weight bioaccumulation factor by 0.32 (percent solids in small mammals).
2 - Converted bioaccumulation factor to wet weight by multiplying by 0.16 (percent soilds of earthworms) because food to mammal BAF was calculated assuming a wet-weight concentration in the food (Sample et al., 1998 for source of bioaccumulation factor).
3 - Calculated by multiplying the soil to worm bioaccumulation factor by the food to mammal bioaccumulation factor.
4 - Average of 22, 11, and 5.6 bioaccumulation factors.

TABLE FCM-22

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Volatile Organic Compounds									
1,2-Dichloroethene (total)	mouse	90 days	oral in water	body/organ wt,bl chem,liver func	452	NOAEL(10)	45.2	subchronic NOAEL/10	Palmer et al (1979) in ORNL (1996)
2-Butanone	rat	3 generations	oral in water	decreased fetal birth weight	3122	reported value	1771	reported value	Cox et al. (1975) in IRIS (2001)
Acetone	rat	90 days	oral intubation	liver and kidney damage	50	subchronic LOAEL/10	10	subchronic NOAEL/10	EPA (1986c) in ORNL (1996)
Benzene	mouse	days 6-12 of gestation	oral gavage	reproduction	263.6	reported value	26.36	LOAEL/10	Nawroot and Staples (1979) in ORNL (1996)
Bromoform	rat	13 weeks	oral gavage	hepatic lesions	35.7	reported value	17.9	reported value	NTP (1989) in IRIS (2001)
Carbon Disulfide	rat (NOAEL); rabbit (LOAEL)	critical lifestage	oral	fetal development	70	reported value	11	reported value	rat-Hardin et al ('81); rabbit- OHMTAD ('90) in Charters et al. ('96)
Methylene Chloride	rat	2 years	oral in water	liver histology	50	reported value	5.85	reported value	NCA (1982) in ORNL (1996)
Tetrachloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	1.4	subchronic NOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Toluene	mouse	days 6-12 of gestation	oral gavage	reproduction	260	reported value	26	LOAEL/10	Nawrot and Staples (1979) in ORNL (1996)
Trichloroethene	mouse	6 weeks	oral gavage	hepatotoxicty	7	subchronic LOAEL/10	0.7	LOAEL/10	Buben and O'Flaherty (1985) in ORNL (1996)
Xylenes, Total	mouse	days 6-15 of gestation	oral gavage	reproduction	2.6	reported value	2.1	reported value	Marks et al. (1982) in ORNL (1996)
Semivolatile Organic Compounds									
2,4-Dinitrotoluene	rat	1 to 2 years	oral in diet	reproduction	0.6	reported value	0.06	LOAEL/10	Eillis et al. ('70); Lee et al. ('78,'85) in ATSDR (1997)
2-Methylnaphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Acenaphthylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(a)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(b)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(g,h,i)perylene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Benzo(k)fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Bis(2-Ethylhexyl)phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	11	NOAEL(10)	1.1	reported value	Peakall (1974) in ORNL (1996)
	mouse	105 days - critical lifestage	oral in diet	reproduction	183	reported value	18.3	reported value	Lamb et al. (1987) in ORNL (1996)
Butylbenzyl Phthalate	rat	6 months	oral in diet	organ toxicity	470	reported value	159	reported value	NTP (1985) in IRIS (2001)
Chrysene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Di-n-butyl phthalate	Ringed Dove	4 weeks - critical lifestage	oral in diet	reproduction	1.1	reported value	0.11	LOAEL/10	Peakall (1974) in ORNL (1996)
	mouse	105 day -critical lifestage	oral in diet	reproduction	1833	reported value	550	reported value	Lamb et al. (1987) in ORNL (1996)
Dibenzo(a,h)anthracene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Diethyl Phthalate	mouse	105 day -critical lifestage	oral in diet	reproduction	45830	NOAEL(10)	4583	reported value	Lamb et al. (1987) in ORNL (1996)
Fluoranthene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Fluorene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Indeno(1,2,3-cd)pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Naphthalene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pentachlorophenol	rat	62 days - critical lifestage	oral in diet	reproduction	2.4	reported value	0.24	reported value	Schwetz et al. (1978) in ORNL (1996)
	Japanese quail	5 days	oral	mortality	68.5	subchronic LOAEL/10	6.85	LOAEL/10	Hill and Camardese (1986) in Sprenger et al. (1996)
Phenanthrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pyrene	mouse	gestation days 7-16	oral intubation	reproduction	10	reported value	1	LOAEL/10	Mackenzie and Angevine (1981) in ORNL (1996) for B[a] P
	starlings (nestling)	5 days	oral gavage	body wt, blood effects	20	reported value	2	reported value	Trust et al. (1993) for 7,12-dimethylbenz(a)anthracene
Pesticides and PCBs									
4,4'-DDD	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDE	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975)
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
4,4'-DDT	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996)
DDTR	American kestrel (wild)	critical lifestage	oral	eggshell thinning	0.9	reported value	0.09	reported value	Lincer (1975) for DDE
	rat	2 years	oral in diet	reproduction	4	reported value	0.8	reported value	Fitzhugh (1984) in ORNL (1996) for DDT
Aldrin	rat	3 generations	oral in diet	reproduction	1	reported value	0.2	reported value	Treon and Cleveland (1955) in ORNL (1996)
Aroclor-1254	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996)
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996)
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich and Ringer (1977) in ORNL (1996)
Aroclor-1260	Ring-necked Pheasant	17 weeks dosed once weely	oral via capsule	reproduction	1.8	reported value	0.18	LOAEL/10	Dahlgren et al. (1972) in ORNL (1996) - Aroclor 1254
	Oldfield mouse	12 months	oral in diet	reproduction	0.68	reported value	0.068	LOAEL/10	McCoy et al. (1995) in ORNL (1996) - Aroclor 1254
	mink	4.5 months -critical lifestage	oral in diet	reproduction	0.69	reported value	0.14	reported value	Aulerich, Ringer (1977) in ORNL (1996) - Aroclor 1254
BHC,alpha	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,beta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,delta	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
BHC,gamma (Lindane)	Japanese quail	90 days - critical lifestage	oral in diet	reproduction	2.25	reported value	0.56	reported value	Vos et al. (1971) in ORNL (1996) for mised isomers
	mink	331 days - critical lifestage	oral in diet	reproduction	0.14	reported value	0.014	LOAEL/10	Bleavins et al. (1984) in ORNL (1996) for mixed isomers
Chlordane,alpha	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Chlordane,gamma	Red-winged Blackbird	84 days	oral in diet	mortality	10.7	reported value	2.14	reported value	Stickel et al. (1983) in ORNL (1996)
	mouse	6 generations	oral in diet	reproduction	9.2	reported value	4.6	reported value	Klepinger et al. (1968) in ORNL (1996)
Dieldrin	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
DieldrinR	Barn owl	2 years	oral in diet	reproduction	0.77	NOAEL(10)	0.077	reported value	Mendenhall et al. (1983) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.2	reported value	0.02	LOAEL/10	Treon and Cleveland (1955) in ORNL (1996)
Endosulfan II	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endosulfan Sulfate	Gray Partridge	4 weeks - critical lifestage	oral in diet	reproduction	100	NOAEL(10)	10	reported value	Abiola (1992) in ORNL (1996)
	rat	30 days	oral intubation	blood chem, reproduction	1.5	NOAEL(10)	0.15	subchronic NOAEL/10	Dikshith et al. (1984) in ORNL (1996)
Endrin	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996)
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996)
Endrin Aldehyde	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Endrin Ketone	Screech Owl	>83 days	oral in diet	reproduction	0.1	reported value	0.01	LOAEL/10	Fleming et al. (1982) in ORNL (1996) for endrin
	mouse	120 days - critical lifestage	oral in diet	reproduction	0.92	reported value	0.092	LOAEL/10	Good and Ware (1969) in ORNL (1996) for endrin
Heptachlor	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996)

TABLE FCM-22

ORAL TOXICITY REFERENCE VALUES (mg/kg-day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Analyte	Surrogate Species	Duration	Exposure Route	Effect	LOAEL mg/kg/day	LOAEL derivation	NOAEL mg/kg/day	NOAEL derivation	Reference
Heptachlor Epoxide	mink	181 days - critical lifestage	oral in diet	reproduction	1	reported value	0.1	LOAEL/10	Crum et al. (1993) in ORNL (1996) for heptachlor
Methoxychlor	rat	11 months - critical lifestage	oral in diet	reproduction	8	reported value	4	reported value	Gray et al. (1988) in ORNL (1996)
Metals and Inorganic Compounds									
Aluminum	ringed dove	4 months in critical lifestage	oral in diet	reproduction	1097	NOAEL(10)	109.7	reported value	Carriere et al. (1986) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	19.3	reported value	1.93	LOAEL/10	Ondreicka et al. (1966) in ORNL (1996)
Antimony	mouse	lifespan	oral in water	longevity	1.25	reported value	0.125	LOAEL/10	Schroeder et al. (1986b) in ORNL (1996)
Arsenic	male Brown-headed Cowbird	7 months	oral in diet	mortality	7.38	reported value	2.46	reported value	USFWS (1969) in ORNL (1996)
	mouse	3 generations	oral in water	reproduction	1.26	reported value	0.126	LOAEL/10	Schroeder and Mitchner (1971) in ORNL (1996)
Barium	1-day old chicks	4 weeks	oral in diet	mortality	417	reported value	208	reported value	Johnson et al. (1960) in ORNL (1996)
	rat	16 months	oral in water	growth, hypertension	51	NOAEL(10)	5.1	reported value	Perry et al. (1983) in ORNL (1996)
Beryllium	rat	lifetime	oral in diet	longevity, weight loss	6.6	NOAEL(10)	0.66	reported value	Schroeder and Mitchner (1975) in ORNL (1996)
Boron	rat	3 generations	oral in diet	reproduction	93.6	reported value	28	reported value	Weir and Fisher (1972) in ORNL (1996)
	Mallard Ducks	gestation, incl. 3 wks prior & post	oral in diet	reproduction	100	reported value	28.8	reported value	Smith and Anders (1989) in ORNL (1996)
Cadmium	Mallard Ducks	90 days - critical lifestage	oral in diet	reproduction	20	reported value	1.45	reported value	White and Finley (1978) in ORNL (1996)
	rat	6 weeks mating/gestation	oral gavage	reproduction	10	reported value	1	reported value	Sutou et al. (1980b) in ORNL (1996)
Chromium, trivalent	Black duck	10 months - critical lifestage	oral in diet	reproduction	5	reported value	1	reported value	Haseltine et al. (unpubl. data) in ORNL (1996)
	rat	90 day and 2 year	oral in diet	longevity, reproduction	27370	NOAEL(10)	2737	reported value	Ivankovic and Preussmann (1975) in ORNL (1996)
Chromium, hexavalent	rat	1 year	oral in water	body wt,food consumption	--	--	3.28	reported value	MacKenzie et al. (1958) in ORNL (1996)
	rat	3 months	oral in water	mortality	13.14	subchronic LOAEL/10	---	---	Steven et al. (1976) in ORNL (1996)
Cobalt	chicken	unknown	oral in diet	appetite, weight	3.1	reported value	0.31	LOAEL/10	NRC (1977) in HSDB (2001)
	rat (weanling)	3.5 months	oral in milk	mortality	1.4	reported value	0.14	LOAEL/10	Patty's Ind. Hygiene (1982) in HSDB (2001)
Copper	1-day old chicks	10 weeks	oral in diet	growth, mortality	61.7	reported value	47	reported value	Mehring et al. (1960) in ORNL (1996)
	mink	357 days- critical lifestage	oral in diet	reproduction	15.4	reported value	11.7	reported value	Aulerich et al. (1982) in ORNL (1996)
Cyanide	rat	gestation and lactation	oral in diet	reproduction	687	NOAEL(10)	68.7	reported value	Tewe and Maner (1981) in ORNL (1996)
Lead	Japanese quail	12 weeks - critical lifestage	oral in diet	reproduction	11.3	reported value	1.13	reported value	Edens et al. (1976) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	8	reported value	Azar et al. (1973) in ORNL (1996)
Iron									
Manganese	Japanese quail - males	75 days	oral in diet	growth,agressiveness	9970	NOAEL(10)	997	reported value	Laskey and Edens (1985) in ORNL (1996)
	rat	through gestation for 224 days	oral in diet	reproduction	284	reported value	88	reported value	Laskey et al. (1982) in ORNL (1996)
Mercury, inorganic	Japanese quail	1 year	oral in diet	reproduction	0.9	reported value	0.45	reported value	Hill and Schaffner (1976) in ORNL (1996)
	mink	6 months - critical lifestage	oral in diet	reproduction	10	NOAEL(10)	1	reported value	Aulerich et al. (1974) in ORNL (1996)
Mercury, methyl	Mallard Ducks	3 generations	oral in diet	reproduction	0.064	reported value	0.0064	LOAEL/10	Heinz (1979) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	0.16	reported value	0.032	reported value	Verschuuren et al. (1976) in ORNL (1996)
Nickel	juvenile Mallard Ducks	90 days	oral in diet	mortality, growth, behavior	107	reported value	77.4	reported value	Cain and Pafford (1981) in ORNL (1996)
	rat	3 generations	oral in diet	reproduction	80	reported value	40	reported value	Ambrose et al. (1976) in ORNL (1996)
Selenium	Mallard Ducks	78 days	oral in diet	reproduction	1	reported value	0.5	reported value	Heinz et al. (1987) in ORNL (1996)
	rat	one year - 2 generations	oral in water	reproduction	0.33	reported value	0.2	reported value	Rosenfeld and Beath (1954) in ORNL (1996)
Silver	mice	125 days	oral in water	hypoactivity	24	reported value	2.4	LOAEL/10	Rungby and Danscher (1984)
Thallium	rat	60 days	oral in water	reproduction	0.074	subchronic LOAEL/10	0.0074	LOAEL/10	Formigli et al. (1986) in ORNL (1996)
Vanadium	Mallard Ducks	12 weeks	oral in diet	mortality, body wt, blood chem	113.8	NOAEL(10)	11.38	reported value	White and Dieter (1978) in ORNL (1996)
	rat	60 days -critical lifestage	oral intubation	reproduction	2.1	reported value	0.21	LOAEL/10	Domingo et al. (1986) in ORNL (1996)
Zinc	White Leghorn Hens	44 weeks	oral in diet	reproduction	131	reported value	14.5	reported value	Stahl et al. (1990) in ORNL (1996)
	rat	days 1-16 of gestation	oral in diet	reproduction	320	reported value	160	reported value	Schlicker and Cox (1968) in ORNL (1996)

TABLE FCM-23

NO OBSERVED ADVERSE EFFECT LEVELS (mg/kg.day)
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	NOAELs		LOAELs	
Chemical	**Bird**	**Mammal**	**Bird**	**Mammal**
Pesticides and PCBs				
4,4'-DDE	0.09	0.8	0.9	4
4,4'-DDT	0.09	0.8	0.9	4
DDTR	0.09	0.8	0.9	4
Dieldrin	0.077	0.02	0.77	0.2
Aroclor-1254	0.18	0.068	1.8	0.68
Aroclor-1260	0.18	0.068	1.8	1.8
Total PCB	0.18	0.068	1.8	0.68
Metals and Inorganic Compounds				
Arsenic	2.46	0.126	7.38	1.26
Cadmium	1.45	1	20	10
Chromium	1	2737	5	27370
Copper	47	11.7	61.7	15.4
Lead	1.13	8	11.3	80
Mercury	0.0064	0.032	0.064	0.16
Silver		2.4		24
Zinc	14.5	160	131	320

TABLE FCM-24

EXPOSURE CONCENTRATIONS FOR ECOLOGICAL RECEPTORS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

TERRESTRIAL RECEPTOR MODELS					
	Surface Soil	Surface Water	Plant	Invertebrate	Small Mammal
	Mean	Mean	Mean	Mean	Mean
Chemical	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
Pesticides PCBs (ug/kg)					
4,4'-DDD	0.004	0	0.00	0.01	0.00
4,4'-DDE	0.011	0	0.00	0.02	0.00
4,4'-DDT	0.007	0	0.00	0.01	0.00
DDTR	0.02	0	0.00	0.04	0.04
ALPHA-CHLORDANE	0.009	0	0.00	0.01	0.01
GAMMA-CHLORDANE	0.009	0	0.00	0.01	0.01
DIELDRIN	0.009	0	0.00	0.01	0.01
AROCLOR-1254	0.043	0	0.00	0.05	0.17
AROCLOR-1260	0.039	0	0.00	0.04	0.16
TOTAL PCB	0.08	0	0.00	0.09	0.33
Metals and Inorganic Compounds					
ARSENIC	2.82	0	0.03	0.10	0.00
CADMIUM	1.14	0	0.02	1.40	0.12
CHROMIUM	10.50	0	0.13	0.51	0.28
COPPER	30.47	0	1.13	2.51	1.91
LEAD	103.33	0	1.21	4.44	3.48
MERCURY	0.10	0	0.02	0.03	0.00
SILVER	1.46	0	0.01	0.48	0.00
ZINC	101.28	0	11.12	51.86	25.01

TABLE FCM-25

FOOD CHAIN MODEL FOR THE COTTON MOUSE - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Cotton Mouse[1]

(Average Inputs)

Body Weight	0.0205970 kg
Food Ingestion Rate	0.0055270 kg/day
Water Ingestion Rate	0.0039130 L/day
Soil Ingestion Rate	0.0001105 kg/day
Site Use Factor	1 (3.0 acre site/0.15 acre mean home range)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.00	0.0001	0.8	8.40E-05	4	1.7E-05
4,4'-DDT	0.007	0	0.00	0.0000	0.8	4.81E-05	4	9.6E-06
DDTR	0.021	0	0.00	0.0001	0.8	1.54E-04	4	3.1E-05
DIELDRIN	0.009	0	0.00	0.0001	0.02	4.29E-03	0.2	4.3E-04
AROCLOR-1254	0.043	0	0.00	0.0003	0.068	3.81E-03	0.68	3.8E-04
AROCLOR-1260	0.039	0	0.00	0.0002	0.068	3.18E-03	1.8	1.2E-04
TOTAL PCB	0.082	0	0.00	0.0005	0.068	7.28E-03	0.68	7.3E-04
Metals and Inorganic Compounds								
ARSENIC	2.819474	0	0.03	0.0236	0.126	1.88E-01	1.26	1.88E-02
CADMIUM	1.136842	0	0.02	0.0115	1	1.15E-02	10	1.15E-03
CHROMIUM	10.5	0	0.13	0.0910	2737	3.33E-05	27370	3.33E-06
COPPER	30.473684	0	1.13	0.4677	11.7	4.00E-02	15.4	3.04E-02
LEAD	103.326316	0	1.21	0.8781	8	1.10E-01	80	1.10E-02
MERCURY	0.101316	0	0.02	0.0059	0.032	1.83E-01	0.16	3.66E-02
SILVER	1.455526	0	0.01	0.0095	2.4	3.94E-03	24	3.94E-04
ZINC	101.284211	0	11.12	3.5278	160	2.20E-02	320	1.10E-02

[1] Based on values for the Deer Mouse in USEPA 1993

TABLE FCM-26

FOOD CHAIN MODEL FOR THE SHORT-TAILED SHREW - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Short-Tailed Shrew
(Average Inputs)

Body Weight	0.0161330 kg
Food Ingestion Rate	0.0089540 kg/day
Water Ingestion Rate	0.0035980 L/day
Soil Ingestion Rate	0.0009312 kg/day
Soil ing. rate based on woodcock	
Site Use Factor	1 (3.0 acre site/0.37 acre mean home range)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.02	0.01	0.8	1.61E-02	4	3.22E-03
4,4'-DDT	0.007	0	0.01	0.01	0.8	1.02E-02	4	2.03E-03
DDTR	0.021	0	0.04	0.03	0.8	3.25E-02	4	6.49E-03
DIELDRIN	0.009	0	0.01	0.01	0.02	2.79E-01	0.2	2.79E-02
AROCLOR-1254	0.043	0	0.05	0.03	0.068	4.10E-01	0.68	4.10E-02
AROCLOR-1260	0.039	0	0.04	0.03	0.068	3.74E-01	1.8	1.41E-02
TOTAL PCB	0.082	0	0.09	0.05	0.068	7.84E-01	0.68	7.84E-02
Metals and Inorganic Compounds								
ARSENIC	2.819474	0	0.10	0.22	0.126	**1.74E+00**	1.26	1.74E-01
CADMIUM	1.136842	0	1.40	0.84	1	8.44E-01	10	8.44E-02
CHROMIUM	10.5	0	0.51	0.89	2737	3.26E-04	27370	3.26E-05
COPPER	30.473684	0	2.51	3.15	11.7	2.69E-01	15.4	2.05E-01
LEAD	103.326316	0	4.44	8.43	8	**1.05E+00**	80	1.05E-01
MERCURY	0.101316	0	0.03	0.02	0.032	6.59E-01	0.16	1.32E-01
SILVER	1.455526	0	0.48	0.35	2.4	1.45E-01	24	1.45E-02
ZINC	101.284211	0	51.86	34.63	160	2.16E-01	320	1.08E-01

TABLE FCM-27

FOOD CHAIN MODEL FOR THE COMMON BOBWHITE - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Common Bobwhite
(Average Inputs)

Body Weight	0.1751000 kg
Food Ingestion Rate	0.0136000 kg/day
Water Ingestion Rate	0.0193000 L/day
Soil Ingestion Rate	0.0011152 kg/day
Soil ing. rate based on Canada goose	
Site Use Factor	0.1 (3.0 acre site/24.6 acre mean home range = 0.004)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.00004	0.00001	0.09	7.79E-05	4	1.75E-06
4,4'-DDT	0.007	0	0.00001	0.00000	0.09	4.79E-05	4	1.08E-06
DDTR	0.021	0	0.00003	0.00001	0.09	1.53E-04	4	3.45E-06
DIELDRIN	0.009	0	0.00015	0.00001	0.077	8.62E-05	0.2	3.32E-05
AROCLOR-1254	0.043	0	0.00011	0.00003	0.18	1.56E-04	0.68	4.14E-05
AROCLOR-1260	0.039	0	0.00002	0.00003	0.18	1.39E-04	1.8	1.39E-05
TOTAL PCB	0.082	0	0.00021	0.00005	0.18	2.99E-04	0.68	7.92E-05
Metals and Inorganic Compounds								
ARSENIC	2.819474	0	0.03	0.0020	2.46	8.30E-04	1.26	1.62E-03
CADMIUM	1.136842	0	0.02	0.0009	1.45	6.06E-04	10	8.79E-05
CHROMIUM	10.5	0	0.1	0.0077	1	7.69E-03	27370	2.81E-07
COPPER	30.473684	0	1.1	0.0282	47	6.00E-04	15.4	1.83E-03
LEAD	103.326316	0	1.2	0.0752	1.13	6.65E-02	80	9.40E-04
MERCURY	0.101316	0	0.02	0.0002	0.0064	3.41E-02	0.16	1.37E-03
SILVER	1.455526	0	0.01	0.0010	NA	NA	NA	NA
ZINC	101.284211	0	11.1	0.1509	14.5	1.04E-02	320	4.72E-04

TABLE FCM-28

FOOD CHAIN MODEL FOR THE AMERICAN ROBIN - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

American Robin
(Average Inputs)

Body Weight	0.0804000 kg
Food Ingestion Rate	0.0968800 kg/day
Water Ingestion Rate	0.0112600 L/day
Soil Ingestion Rate	0.0100755 kg/day
Soil ing. rate based on woodcock	
Site Use Factor	1 (3.0 acre site/1.11 acre mean home range)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.02	0.03	0.09	3.11E-01	4	7.0E-03
4,4'-DDT	0.007	0	0.01	0.02	0.09	1.96E-01	4	4.4E-03
DDTR	0.021	0	0.04	0.06	0.09	6.27E-01	4	1.4E-02
DIELDRIN	0.009	0	0.01	0.01	0.077	1.57E-01	0.2	6.1E-02
AROCLOR-1254	0.043	0	0.05	0.06	0.18	3.36E-01	0.68	8.9E-02
AROCLOR-1260	0.039	0	0.04	0.06	0.18	3.07E-01	1.8	3.1E-02
TOTAL PCB	0.082	0	0.09	0.12	0.18	6.43E-01	0.68	1.7E-01
Metals and Inorganic Compounds								
ARSENIC	2.82	0	0.10	0.48	2.46	1.93E-01	1.26	3.8E-01
CADMIUM	1.14	0	1.40	1.83	1.45	**1.26E+00**	10	1.8E-01
CHROMIUM	10.50	0	0.51	1.94	1	**1.94E+00**	27370	7.1E-05
COPPER	30.47	0	2.51	6.84	47	1.46E-01	15.4	4.4E-01
LEAD	103.33	0	4.44	18.30	1.13	**1.62E+01**	80	2.3E-01
MERCURY	0.10	0	0.03	0.05	0.0064	**7.15E+00**	0.16	2.9E-01
SILVER	1.46	0	0.48	0.76	NA	NA	NA	NA
ZINC	101.28	0	51.86	75.18	14.5	**5.18E+00**	320	2.3E-01

TABLE FCM-29

FOOD CHAIN MODEL FOR THE RED-TAILED HAWK - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Red-Tailed Hawk
(Average Inputs)

Body Weight	1.1340000 kg
Food Ingestion Rate	0.1120000 kg/day
Water Ingestion Rate	0.0646400 L/day
Soil Ingestion Rate	0.0031360 kg/day
Soil ing. rate based on red fox	
Site Use Factor	0.1 (3.0 acre site/997 acre mean home range = 0.003)

Mean Concentrations

ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.00	0.00001	0.09	1.04E-04	4	2.3E-06
4,4'-DDT	0.007	0	0.00	0.00002	0.09	2.26E-04	4	5.1E-06
DDTR	0.021	0	0.04	0.00045	0.09	4.96E-03	4	1.1E-04
DIELDRIN	0.009	0	0.01	0.00008	0.077	1.10E-03	0.2	4.2E-04
AROCLOR-1254	0.043	0	0.17	0.00171	0.18	9.49E-03	0.68	2.5E-03
AROCLOR-1260	0.039	0	0.16	0.00156	0.18	8.65E-03	1.8	8.6E-04
TOTAL PCB	0.082	0	0.33	0.00326	0.18	1.81E-02	0.68	4.8E-03
Metals and Inorganic Compounds								
ARSENIC	2.819474	0	0.00	0.000802	2.46	3.26E-04	1.26	6.4E-04
CADMIUM	1.136842	0	0.12	0.001512	1.45	1.04E-03	10	1.5E-04
CHROMIUM	10.5	0	0.28	0.005711	1	5.71E-03	27370	2.1E-07
COPPER	30.473684	0	1.91	0.027333	47	5.82E-04	15.4	1.8E-03
LEAD	103.326316	0	3.48	0.062994	1.13	5.57E-02	80	7.9E-04
MERCURY	0.101316	0	0.00	0.000045	0.0064	7.09E-03	0.16	2.8E-04
SILVER	1.455526	0	0.00	0.0004	NA	NA	NA	NA
ZINC	101.284211	0	25.01	0.2750	14.5	1.90E-02	320	8.6E-04

TABLE FCM-30

FOOD CHAIN MODEL FOR THE GRAY FOX - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Gray Fox[1]								
(Average Inputs)								
Body Weight	4.5350000	kg						
Food Ingestion Rate	0.4288000	kg/day						
Water Ingestion Rate	0.3850000	L/day						
Soil Ingestion Rate	0.0120064	kg/day						
Site Use Factor	0.1	(3.0 acre site/1365 acre mean home range = 0.002)						
Mean Concentrations								
ECOC	Soil Concentration (mg/kg)	Water Concentration (mg/L)	Small Mammal Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	NOAEL HQ	LOAEL (mg/kg/day)	LOAEL HQ
Pesticides PCBs (ug/kg)								
4,4'-DDE	0.011	0	0.00	0.00001	0.8	1.12E-05	4	2.2E-06
4,4'-DDT	0.007	0	0.00	0.00002	0.8	2.44E-05	4	4.9E-06
DDTR	0.021	0	0.04	0.00043	0.8	5.34E-04	4	1.1E-04
DIELDRIN	0.009	0	0.01	0.00008	0.02	4.05E-03	0.2	4.0E-04
AROCLOR-1254	0.043	0	0.17	0.00163	0.068	2.40E-02	0.68	2.4E-03
AROCLOR-1260	0.039	0	0.16	0.00149	0.068	2.19E-02	1.8	8.3E-04
TOTAL PCB	0.082	0	0.33	0.00312	0.068	4.59E-02	0.68	4.6E-03
Metals and Inorganic Compounds								
ARSENIC	2.819474	0	0.00	0.001	0.126	6.09E-03	1.26	6.1E-04
CADMIUM	1.136842	0	0.12	0.001	1	1.45E-03	10	1.4E-04
CHROMIUM	10.5	0	0.28	0.005	2737	2.00E-06	27370	2.0E-07
COPPER	30.473684	0	1.91	0.026	11.7	2.24E-03	15.4	1.7E-03
LEAD	103.326316	0	3.48	0.060	8	7.54E-03	80	7.5E-04
MERCURY	0.101316	0	0.00	0.000	0.032	1.36E-03	0.16	2.7E-04
SILVER	1.455526	0	0.00	0.000	2.4	1.68E-04	24	1.7E-05
ZINC	101.284211	0	25.01	0.263	160	1.65E-03	320	8.2E-04
[1] Based on values for the Red Fox in USEPA 1993								

TABLE FCM-31

HAZARD QUOTIENTS USING MEAN SURFACE SOIL CONCENTRATIONS
TERRESTRIAL RECEPTORS - AVERAGE INPUTS
SITE 16: OPEN DISPOSAL AND BURNING AREA
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

	Cotton Mouse		Shrew		Bobwhite		Robin		Hawk		Fox	
Ecological Contaminant of Concern	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**	**NOAEL HQ**	**LOAEL HQ**
Pesticides and PCBs												
4,4'-DDE	8.40E-05	1.68E-05	1.61E-02	3.22E-03	7.79E-05	1.75E-06	3.11E-01	6.99E-03	1.04E-04	2.33E-06	1.12E-05	2.23E-06
4,4'-DDT	4.81E-05	9.63E-06	1.02E-02	2.03E-03	4.79E-05	1.08E-06	1.96E-01	4.41E-03	2.26E-04	5.09E-06	2.44E-05	4.87E-06
DDTR	1.54E-04	3.08E-05	3.25E-02	6.49E-03	1.53E-04	3.45E-06	6.27E-01	1.41E-02	4.96E-03	1.12E-04	5.34E-04	1.07E-04
DIELDRIN	4.29E-03	4.29E-04	2.79E-01	2.79E-02	8.62E-05	3.32E-05	1.57E-01	6.06E-02	1.10E-03	4.23E-04	4.05E-03	4.05E-04
AROCLOR-1254	3.81E-03	3.81E-04	4.10E-01	4.10E-02	1.56E-04	4.14E-05	3.36E-01	8.90E-02	9.49E-03	2.51E-03	2.40E-02	2.40E-03
AROCLOR-1260	3.18E-03	1.20E-04	3.74E-01	1.41E-02	1.39E-04	1.39E-05	3.07E-01	3.07E-02	8.65E-03	8.65E-04	2.19E-02	8.28E-04
TOTAL PCB	7.28E-03	7.28E-04	7.84E-01	7.84E-02	2.99E-04	7.92E-05	6.43E-01	1.70E-01	1.81E-02	4.80E-03	4.59E-02	4.59E-03
Metals and Inorganic Compounds												
ARSENIC	1.88E-01	1.88E-02	**1.74E+00**	1.74E-01	8.30E-04	1.62E-03	1.93E-01	3.77E-01	3.26E-04	6.36E-04	6.09E-03	6.09E-04
CADMIUM	1.15E-02	1.15E-03	8.44E-01	8.44E-02	6.06E-04	8.79E-05	**1.26E+00**	1.83E-01	1.04E-03	1.51E-04	1.45E-03	1.45E-04
CHROMIUM	3.33E-05	3.33E-06	3.26E-04	3.26E-05	7.69E-03	2.81E-07	**1.94E+00**	7.07E-05	5.71E-03	2.09E-07	2.00E-06	2.00E-07
COPPER	4.00E-02	3.04E-02	2.69E-01	2.05E-01	6.00E-04	1.83E-03	1.46E-01	4.44E-01	5.82E-04	1.77E-03	2.24E-03	1.70E-03
LEAD	1.10E-01	1.10E-02	**1.05E+00**	1.05E-01	6.65E-02	9.40E-04	**1.62E+01**	2.29E-01	5.57E-02	7.87E-04	7.54E-03	7.54E-04
MERCURY	1.83E-01	3.66E-02	6.59E-01	1.32E-01	3.41E-02	1.37E-03	**7.15E+00**	2.86E-01	7.09E-03	2.84E-04	1.36E-03	2.72E-04
SILVER	3.94E-03	3.94E-04	1.45E-01	1.45E-02	NA	NA	NA	NA	NA	NA	1.68E-04	1.68E-05
ZINC	2.20E-02	1.10E-02	2.16E-01	1.08E-01	1.04E-02	4.72E-04	**5.18E+00**	2.35E-01	1.90E-02	8.59E-04	1.65E-03	8.23E-04

APPENDIX C-2

2000 ERAS FOR SITES 11 AND 16

7.0 ECOLOGICAL RISK ASSESSMENT

The ERA evaluates actual and potential adverse effects to ecological receptors associated with exposure to chemicals from Site 11, the Southeast Open Disposal Area (B) (Landfill), at NAS Whiting Field. The ERA for Site 11 follows the methodologies described in the NAS Whiting Field GIR (ABB-ES, 1998), and current guidance materials for ERAs at Superfund sites including the following:

- *Risk Assessment Guidance for Superfund Volume 2: Environmental Evaluation Manual* (USEPA, 1989c)
- *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1989d)
- *Framework for Ecological Risk Assessment* (USEPA, 1992b)
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997d)
- *Supplemental Guidance to RAGS: Region 4 Bulletins on Ecological Risk Assessment* (USEPA, 1995a)
- *Proposed Guidelines for Ecological Risk Assessment* (USEPA, 1996c)

Risk assessment guidance included in the USEPA "Eco Update" bulletins (1991c, 1992c, and 1992d) and recent publications (e.g., Maughan, 1993; Suter, 1993) were also consulted.

This ERA was conducted to determine if ecological receptors are potentially exposed to contaminants from Site 11 at concentrations that could cause adverse ecological effects. The Site 11 ERA consists of eight sections.

- Site Characterization (Section 7.1) describes current ecological conditions at the site.
- Problem Formulation (Section 7.2) establishes the goals and focus of the assessment and identifies major factors to be considered.
- Hazard Assessment and Selection of Ecological Chemicals of Potential Concern (ECPCs) (Section 7.3) reviews the analytical data and identifies chemicals present at the site that may pose ecological risks.
- Exposure Assessment (Section 7.4) identifies complete exposure pathways and quantifies the magnitude and frequency of exposure.
- Ecological Effects Assessment (Section 7.5) identifies potential adverse effects to ecological receptors associated with the chemicals of concern identified in Section 7.3.
- Risk Characterization (Section 7.6) integrates exposure and concentration-toxicity response information to derive a likely estimate of adverse effects.

- Uncertainties (Section 7.7) identifies assumptions of the ERA process that may influence the risk assessment conclusions.

- Summary of Ecological Risk (Section 7.8).

7.1 SITE CHARACTERIZATION. NAS Whiting Field Site 11 is approximately 3 acres in size and is located along the eastern facility property boundary near the South Air Field (see Figure 1-2). The site is an old borrow pit that was used as an open disposal area from 1943 until approximately 1970. During its active period, Site 11 received a wide variety of wastes, including general refuse, construction debris, tree clippings, furniture, waste solvents, paint, transformer oils, hydraulic fluid, and various other oils. When disposal activities were discontinued in 1970, a final covering of soil from NAS Whiting Field was placed over the site and pine trees were planted (Geraghty & Miller, 1986).

As shown in the Site 11 vegetative cover map (Figure 7-1), planted pine trees border the northern, western, and southern perimeter of the site. The eastern boundary of Site 11 is characterized as an old field, while the center of the site is dominated by shrubs.

Saplings and shrubs commonly found in the planted pine area of Site 11 include various oaks (*Quercus* sp.), long-leaf pine (*Pinus palustris*), slash pine (*Pinus elliotii*), yaupon holly (*Ilex vomitoria*), blueberry (*Vaccinium* sp.), gallberry (*Ilex coriacea*), Chinese privet (*Ligustrum sinense*), cherry (*Prunus* sp.), red maple (*Acer rubrum*), hickory (*Carya* sp.), red cedar (*Juniperus virginiana*), winged sumac (*Rhus copallina*), groundsel tree (*Baccharis halimifolia*), and willow (*Salix* sp.). Species commonly found in the herbaceous strata of the planted pine habitat include several members of the aster, madder, and pea families; morning glories; grapes; yucca; Japanese honeysuckle, and several grasses. A complete list of the vegetative species occurring at Site 11 is provided in Appendix G of the GIR (ABB-ES, 1998).

NAS Whiting Field maintains a program for planting and harvesting of pine trees, primarily long-leaf and slash pines. The planted pine area of Site 11 is subject to controlled burns and timber harvesting activities. As part of the ecosystem management plan, planted pine forests undergo periodic burning, usually once every four years, and selective thinning of long-leaf and slash pines every eight to ten years. These forestry management activities provide a variety of habitats and food sources. The planted pine area of Site 11 is reaching a mature status with a well-developed canopy and an open understory typical of uplands pine forests of the southeastern United States.

Southeastern pine forests provide habitats for a diverse array of birds, including insectivorous gleaners of pine needles and bark, flycatchers, seed-eaters, and nocturnal and diurnal aerial predators (Wolfe et. al., 1988). The pine flatwoods at Site 11 are likely to host such an assemblage of species. Birds of prey, such as owls and hawks, may also nest in these wooded areas.

It is likely that the terrestrial invertebrate biomass at Site 11 serves as a forage base for a variety of wildlife species, including adult amphibians, reptiles, small birds, and small mammals. Small reptiles, mammals, and birds may use the open portions of Site 11 for foraging, while returning to the forested

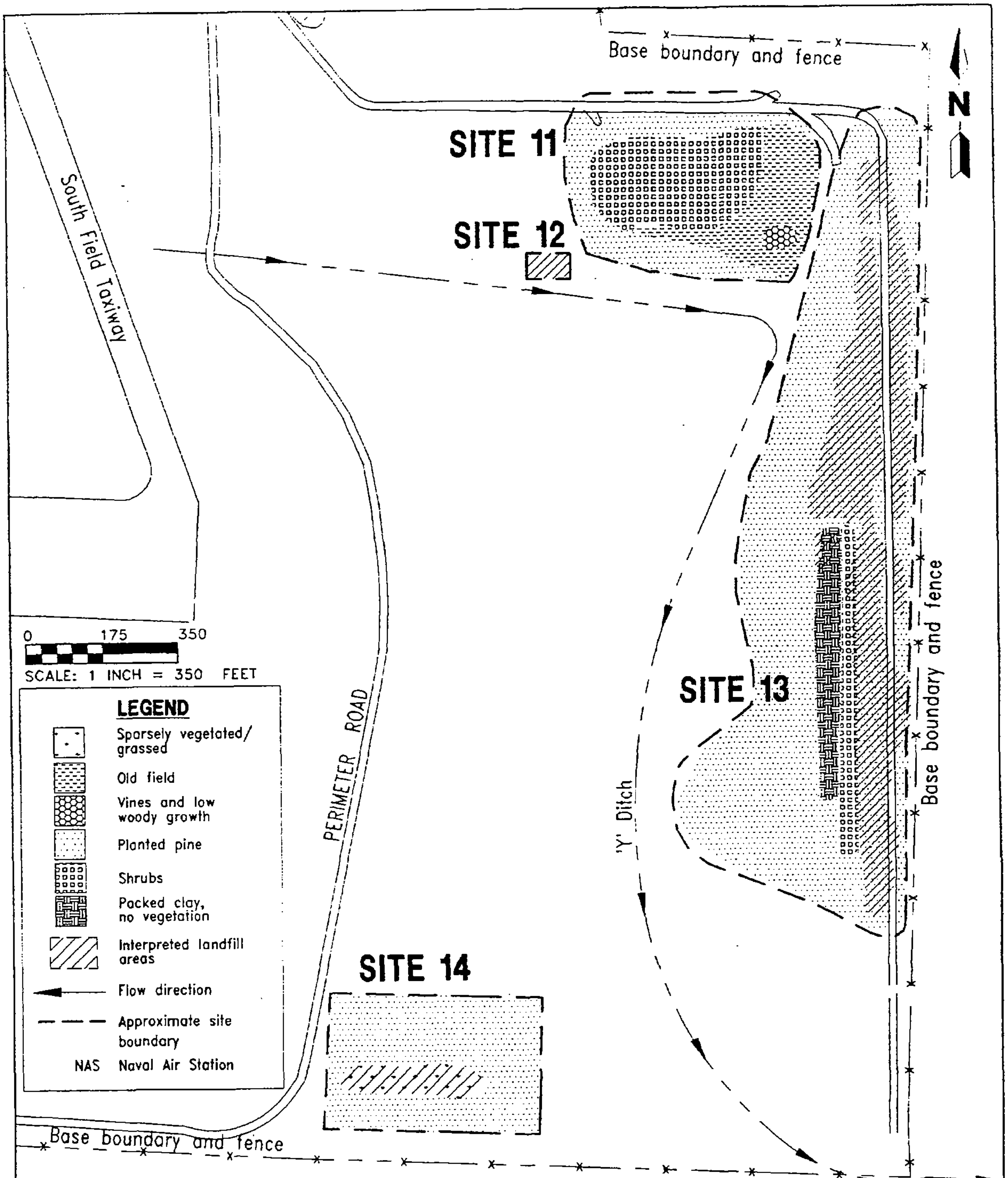

FIGURE 7-1
VEGETATIVE COVER MAP

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REMEDIAL INVESTIGATION REPORT
SITE 11, SOUTHEAST OPEN DISPOSAL AREA (B)

NAS WHITING FIELD
MILTON, FLORIDA

pine area for protection. Predatory birds and mammals inhabiting the pine flatwood areas may also be attracted to the site.

Mammals and birds that may occur in the planted pine area of Site 11 include the Eastern cottontail rabbit (*Sylvilagus floridanus*), the hispid cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), short-tailed shrew (*Blarina brevicauda*), American robin (*Turdus migratorius*), and Eastern meadowlark (*Sturnella magna*). Predatory mammals and birds such as the red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), great horned owl (*Bubo virginianus*), and the red-tailed hawk (*Buteo jamaicensis*) may also forage in the area of Site 11.

The "Y" drainage ditch is located approximately 80 feet south of site; however, off-site migration of site-related surface soil constituents to the ditch is unlikely because the topography of Site 11 gently slopes toward the east-northeast. During the 1986 verification study, a low point was observed in the northeastern corner where surface drainage ponds (Geraghty & Miller, 1986). Although ponding was not observed during the 1995 site characterization survey, it is expected that any runoff from the site would migrate in a northeasterly direction toward Big Coldwater Creek, which is located approximately 1.7 miles from Site 11.

Although no aquatic habitat is present at Site 11, groundwater from Site 11 may discharge to Big Coldwater Creek. Groundwater discharge to surface water is not evaluated as part of the ERA for Site 11 because Big Coldwater Creek receives groundwater discharge and stormwater runoff from multiple sources of potential contamination at NAS Whiting Field. In addition, Big Coldwater Creek is located more than 9,000 feet from Site 11 and concentrations of contaminants in Site 11 groundwater are low enough that they are not a concern for current and future discharges to surface water.

<u>7.2 PROBLEM FORMULATION</u>. The problem formulation is the initial step of the ERA process. Problem formulation is composed of identification of receptors, identification of exposure pathways for those receptors, and selection of assessment and measurement endpoints based on information gathered from the site characterization.

<u>7.2.1 Identification of Receptors</u> Ecological receptors that may potentially utilize the available planted pine and overgrown field habitat at Site 11 include terrestrial wildlife (i.e., mammals, birds, reptiles, and adult amphibians), terrestrial plants, and soil invertebrates. Terrestrial flora and fauna potentially using NAS Whiting Field are identified in the GIR (ABB-ES, 1998). Aquatic receptors are not evaluated in the ERA because no aquatic habitats exist at Site 11.

Certain species that potentially reside at NAS Whiting Field are protected by Federal and/or State laws. A list of State and federally protected species is provided in the GIR (ABB-ES, 1998). Observations made during an ecological survey of NAS Whiting field indicate that no State or federally listed rare, threatened, or endangered species or species of concern are known or likely to inhabit Site 11 (Nature Conservancy, 1997).

7.2.2 Identification of Exposure Pathways Exposure pathways are identified for three groups of receptors (terrestrial wildlife, terrestrial plants, and soil invertebrates). A complete exposure pathway includes a source of contamination, an exposure route, and a receptor. A conceptual model of the exposure pathways from source to ecological receptors is depicted in the contaminant pathway model on Figure 7-2.

All potential routes of exposure are considered in the ERA and are presented in the contaminant pathway model. The model differentiates between those exposure routes that are quantitatively evaluated and those that are qualitatively discussed. This limitation is necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur. Those pathways that cannot be quantitatively evaluated, due to a lack of toxicological information, are qualitatively discussed and addressed as uncertainties. The general approach used to identify exposure pathways for the three groups of receptors is explained below.

Terrestrial Wildlife. Terrestrial wildlife may be exposed to contaminants in surface soil, surface water, and food items that are contaminated as a result of ingestion, dermal adsorption, and inhalation of fugitive dust and volatile emissions. Because no surface water is present at Site 11, only exposures to surface soil and potentially contaminated food are evaluated in the Site 11 ERA.

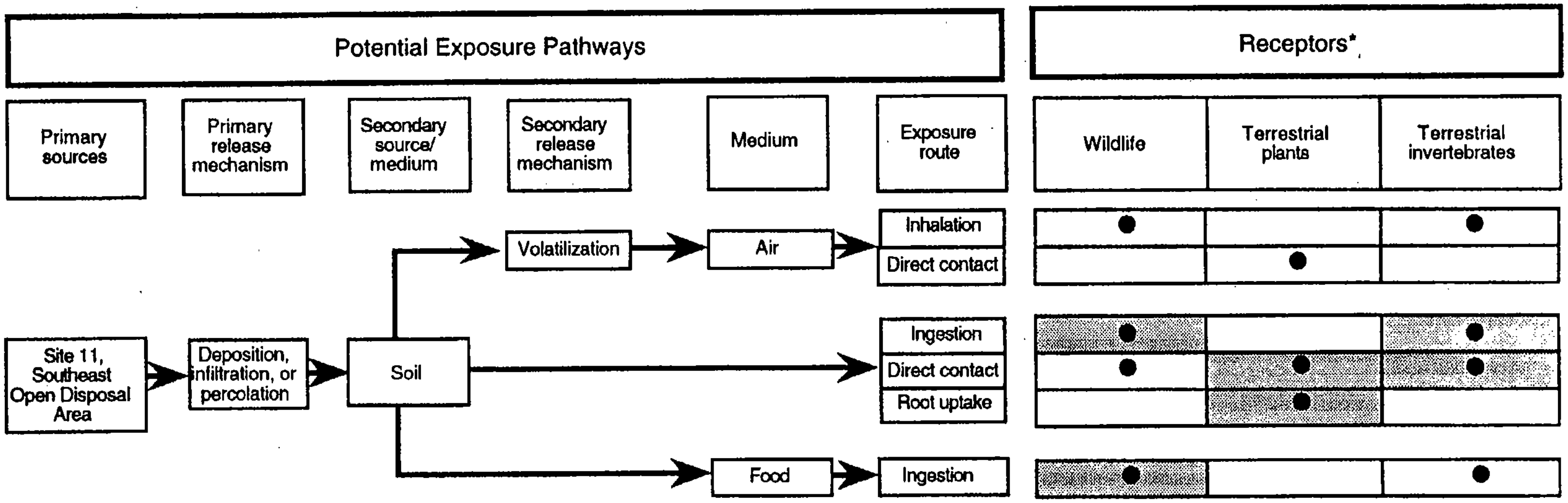
Dermal adsorption is considered to be a negligible exposure pathway because the presence of fur, feathers, or a chitinous exoskeleton is likely to prevent contamination from coming in direct contact with the skin (personal communication with Ted Simon, USEPA Region 4, September 1997). In addition, soil trapped in the fur or feathers is likely to be ingested during grooming or preening activities, which are evaluated as part of the indirect ingestion exposure pathway.

Exposure via inhalation of fugitive dust is also not likely to be a significant exposure pathway because the vegetation at Site 11 would limit the release of fugitive dust. Only one volatile constituent, acetone, was detected in the surface soil at Site 11. Exposures associated with VOCs are not evaluated in the ERA because of the low frequency and detection of VOCs in the surface soil. In addition, no evidence of burrowing animals and/or burrows was noted during the site characterization.

Potential contaminant exposures for reptiles and adult amphibians exist at NAS Whiting Field; however, ingestion toxicity data and bioaccumulation factors (BAF) are generally not available for these receptors. Therefore, potential risks associated with ingestion of affected media and food to these reptiles and amphibians will be qualitatively addressed in the Uncertainties Section of the ERA.

Terrestrial Plants and Invertebrates. Terrestrial plants and soil invertebrates may be exposed to contamination in surface soil by direct contact with and root uptake (plants) or ingestion (invertebrates) of soil. The ingestion exposure routes include the ingestion of soil and food items containing chemicals accumulated from Site 11 surface soil. Because the depth to groundwater is between 44 and 90 feet bls, far below the root zone of Site 11 plants, it is not expected that terrestrial plants are exposed to contamination in groundwater.

7.2.3 Identification of Endpoints The assessment and measurement endpoints selected for the Site 11 ERA are listed in Table 7-1. Assessment endpoints



NOTES:
NAS = Naval Air Station
ERA = ecological risk assessment

* Shading indicates the exposure pathways that are quantitatively evaluated for receptors in the Site 11 ERA. Nonshaded pathways are not evaluated because they are not considered significant pathways.

FIGURE 7-2
SITE 11, CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS

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SITE 11, SOUTHEAST OPEN DISPOSAL AREA

NAS WHITING FIELD
MILTON, FLORIDA

2534-09 FIG 7-2 (site 11) FINAL 010798MAW

Table 7-1
Endpoints Selected for Ecological Risk Assessment

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Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Assessment Endpoint [a]	Receptor	Measurement Endpoint	Decision Point
Survival and growth of plant communities used as forage material.	Terrestrial plants	Germination of lettuce seeds exposed to surface soil samples in laboratory toxicity tests.	Significant differences ($P \leq 0.05$) in germination of lettuce seeds exposed to surface soil from Site 11 as compared to laboratory control and reference soil.
Survival and growth of terrestrial invertebrate communities used as forage material.	Terrestrial invertebrates	Survival and growth of earthworms exposed to surface soil samples in toxicity tests.	Significant differences ($P \leq 0.05$) in survival and/or growth of earthworms exposed to surface soil from Site 11 as compared to earthworms exposed to laboratory control and reference soil.
Survival and maintenance of wildlife populations.	Wildlife species	Oral chemical doses (mg/kg BW/day) based on measured adverse effects on growth, reproduction, or survival (i.e., NOAEL, LOAEL, and LD_{50} studies) of mammalian and avian laboratory test populations.	Comparison of potential dietary exposures in mammalian and avian wildlife with literature-derived RTVs. HQs >1 indicate potential risk.

[a] The assessment endpoints are discussed in further detail in Subsection 7.2.3.

Notes: P = probability.
≤ = less than or equal to.
mg/kg = milligrams per kilogram.
BW/day = body weight per day.
NOAEL = no observed adverse effect level.
LOAEL = lowest observed adverse effect level.
LD_{50} = lethal dose to 50 percent of a test population.
RTV = reference toxicity value.
HQ = hazard quotient.
> = greater than.

represent the ecological component to be protected, whereas the measurement endpoints approximate or provide a measure of the achievement of the assessment endpoint. The assessment endpoint selected for the Site 11 ERA is the survival and maintenance of receptor populations and communities at Site 11. The measurement endpoints used to gauge the likelihood of population- and community-level effects for terrestrial wildlife are chemical-specific toxicological benchmark values derived from the literature that are based on laboratory-measured survival, growth, and reproductive effects. For terrestrial plants and soil invertebrates at Site 11, the assessment endpoint is measured by the survival and growth of the earthworm (*Eisenia foetida*) in toxicity testing and response of the lettuce seed (*Lactuca sativa*) in germination tests with Site 11 surface soil samples. Table 7-1 presents the assessment endpoint, endpoint species, measurement endpoint, and decision point (i.e., the level at which additional evaluation may be warranted).

Four hypotheses were developed to gauge potential risks associated with exposure to Site 11 surface soil. These hypotheses are designed for multiple species and trophic levels and represent both individual and community dynamics. Hypotheses for the Site 11 ERA listed below.

1. Are ECPCs present in the surface soil at concentrations sufficiently high to reduce plant or soil invertebrate biomass or plant cover availability such that small mammal and bird populations could be affected?

2. Are ECPCs present in the surface soil at concentrations sufficiently high to reduce the survivability and growth of terrestrial plants and soil invertebrates?

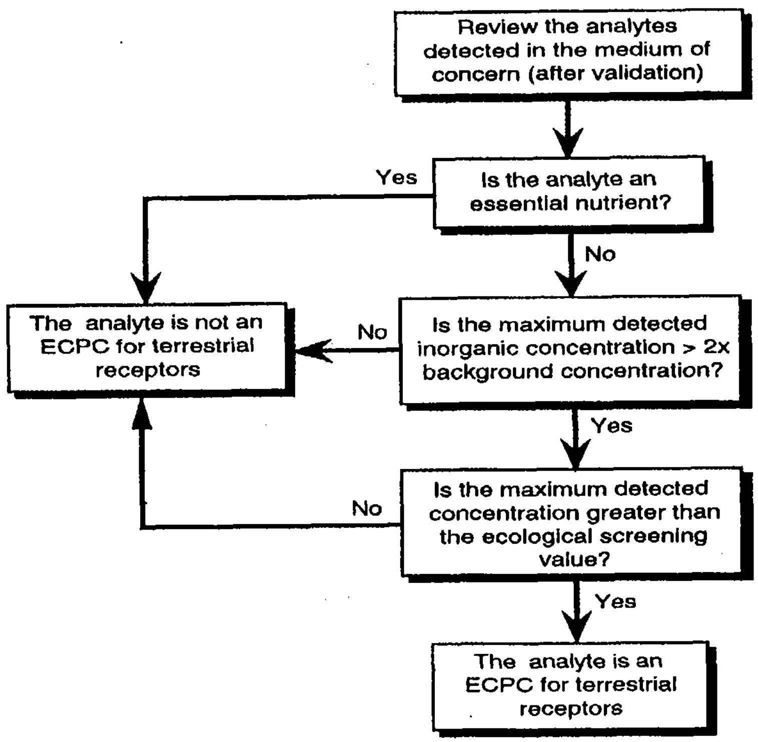
3. Are ECPC concentrations in plants and invertebrates sufficiently high as to adversely affect foraging small mammal or bird populations following consumption of contaminated prey?

4. Are bioaccumulating chemicals sufficiently high to reduce survivability, growth, or reproduction in top predators (i.e., foxes and owls)?

7.3 HAZARD ASSESSMENT AND SELECTION OF ECPCs. The hazard assessment includes a review of analytical data and selection of ECPCs. ECPCs represent analytes detected in environmental media (i.e., surface soil) that are considered in the ERA and could present a potential risk for ecological receptors. The process for selecting ECPCs is depicted on Figure 7-3. Additional details regarding the ECPC selection process are provided in Subsection 2.4.2 of the GIR (ABB-ES, 1998). Analytical data for Site 11 were evaluated for use in risk assessment pursuant to national guidance, *Guidance for Data Useability in Risk Assessment (Parts A and B)* (USEPA, 1992e).

Following the data validation step, calcium, iron, magnesium, potassium, and sodium are excluded as ECPCs because they are considered to be essential nutrients and not toxic. The rationale for eliminating essential nutrients as ECPCs is provided in the GIR (ABB-ES, 1998).

Inorganic chemicals representative of background conditions are not selected as ECPCs. In accordance with USEPA Region IV guidance (USEPA, 1991b), an inorganic



NOTES:
NAS = Naval Air Station
ECPC = ecological chemical of potential concern
> = greater than
x = times
Terrestrial receptors include terrestrial wildlife, plants, and invertebrates

FIGURE 7-3
ECOLOGICAL CHEMICAL OF POTENTIAL CONCERN SELECTION PROCESS

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2534-09 FIG 7-3 (site 11) FINAL 021798MAW analyte is not selected as an ECPC if the maximum detected concentration is less than 2 times the average detected inorganic concentration in background samples. The maximum detected concentrations are compared against representative site-specific background soil screening concentrations to eliminate chemicals that are unlikely to be site related.

A site-specific background investigation was conducted at NAS Whiting Field, and the findings are presented in Section 3.3.1.1 of the GIR (ABB-ES, 1998). The site-specific background study used to establish background screening values for Site 11 consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and one duplicate sample (BKS00201D) collected from Troup loamy sand and Dothan fine sandy loam soil types, which are similar to the soil types at Site 11.

Analytes that are not essential nutrients and exceed the background screening concentration are also screened against ecological screening values for surface soil. The surface soil ecological screening values are the Dutch Soil Criteria "A", which refer to background concentrations in surface soil issued by the U.S. Fish and Wildlife Service (Beyer, 1990). If the maximum detected concentration of an analyte exceeds the ecological screening value, the analyte is retained as an ECPC for terrestrial wildlife, which also includes terrestrial plants and soil invertebrates.

During the August 1992 Phase IIA investigation, five surface soil samples (11-SL-01 through 11-SL-05) and one duplicate (11-SL-01A) were collected at Site 11 (Figure 3-2). These samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL inorganic analytes. In January 1996, 13 additional surface soil samples were collected from Site 11 as part of the Phase IIB investigation. Five of the thirteen sampling locations were determined using the random and unbiased systematic sampling method described in Section 3.3. These five samples (11S00101 through 11S00501) were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganic analytes and TPH. The remaining eight samples (11S00601 through 11S01301) were collected within a 10-foot-radius surrounding the Phase IIA sample 11-SL-2, where an elevated lead concentration of 2,230 mg/kg was detected. These eight samples were analyzed for lead only for source delineation.

Table 7-2 presents a summary of the analytical data and the following information: frequency of detection, range of detection limits, range of detected concentrations, average of detected concentrations, background screening concentrations, ecological screening values, and selected ECPCs. ECPCs selected for the surface soil samples collected at Site 11 include one VOC (acetone), 14 semivolatiles (2-methylnaphthalene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)-fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, and bis(2-ethylhexyl)phthalate), five pesticides (4,4'-DDD, 4,4'-DDT, dieldrin, alpha-chlordane, and gamma-chlordane), three inorganic analytes (lead, silver, and zinc), and TPH.

7.4 EXPOSURE ASSESSMENT. The purpose of the ecological exposure assessment is to estimate or measure the amount of an ECPC to which an ecological receptor may be exposed. The following sections briefly describe how contaminant exposures are estimated or measured for wildlife, terrestrial plants, and invertebrates at Site 11. The contaminant pathway model (Figure 7-2) provides a summary of the

Table 7-2
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

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Site 11, Southeast Open Disposal Area (B) (Landfill)
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Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Volatiles Organic Compounds (µg/kg)											
Acetone	1/10	11 to 13	53.25*	53.3	ND	NA	Yes	16.8	10.3	16.8	10.3
Semivolatile Organic Compounds (µg/kg)											
2-Methylnaphthalene	1/10	350 to 4,000	49	49	ND	NA	Yes	757	352	49	49
Acenaphthylene	1/10	350 to 4,000	110	110	ND	NA	Yes	614	358	110	110
Anthracene	1/10	350 to 4,000	280	280	ND	100	Yes	620	375	280	280
Benzo(a)anthracene	1/10	350 to 4,000	1,800	1,800	ND	NA	Yes	976	527	976	527
Benzo(a)pyrene	1/10	350 to 4,000	910	910	ND	100	Yes	806	438	806	438
Benzo(b)fluoranthene	1/10	350 to 4,000	710	710	ND	NA	Yes	777	418	710	418
Benzo(g,h,i)perylene	1/10	350 to 4,000	310	310	ND	NA	Yes	626	378	310	310
Benzo(k)fluoranthene	1/10	350 to 4,000	870	870	ND	NA	Yes	800	434	800	434
Chrysene	1/10	350 to 4,000	2,500	2,500	ND	NA	Yes	1,142	597	1,142	597
Fluoranthene	1/10	350 to 4,000	1,300	1,300	ND	100	Yes	873	477	873	477
Indeno(1,2,3-cd)-pyrene	1/10	350 to 4,000	230	230	ND	NA	Yes	608	370	230	230
Phenanthrene	1/10	350 to 4,000	2,100	2,100	ND	100	Yes	1,045	557	1,045	557
Pyrene	1/10	350 to 4,000	3,400	3,400	ND	100	Yes	1,375	687	1,375	687
bis(2-Ethylhexyl)-phthalate	5/10	350 to 4,000	52 to 540	175	80.3	NA	Yes	727	360	540	360

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Pesticides and PCBs (μg/kg)											
4,4'-DDD	1/10	3.6 to 980	140	140	ND	100	Yes	123	55.9	123	55.9
4,4'-DDE	7/10	3.7 to 980	2.1 to 88	26.5	ND	100	No[11]				
4,4'-DDT	8/10	3.7 to 980	2.3 to 530	81.8	ND	100	Yes	168	66.5	168	66.5
Aldrin	1/10	1.9 to 490	0.96 to 0.96	0.96	ND	100	No[11]				
Dieldrin	8/10	3.7 to 980	4.9 to 210	42.9	ND	100	Yes	74	35.4	74	35.4
Heptachlor	1/10	1.9 to 490	4.8	4.8	ND	100	No[11]				
Heptachlor epoxide	1/10	1.9 to 490	8.8	8.8	ND	100	No[11]				
alpha-Chlordane	4/10	1.9 to 4,900	39 to 310	140	ND	100	Yes	130	69.9	130	69.9
gamma-Chlordane	4/10	1.9 to 4,900	29 to 260	111	ND	100	Yes	108	58.1	108	58.1
Inorganic Analytes (mg/kg)											
Aluminum	10/10	40	2,110 to 10,800	7,486	15,314	NA	No[12]				
Antimony	1/10	2.6 to 12	3.5	3.5	8	NA	No[12]				
Arsenic	10/10	2	0.93 to 3.8	2.1	3.0	20	No[11]				
Barium	10/10	40	4.6 to 96	19.2	23.8	200	No[11]				
Beryllium	7/10	0.05 to 1	0.05 to 0.14	0.09	0.36	NA	No[12]				
Cadmium	2/10	0.58 to 1	0.24 to 0.28	0.26	0.58	1	No[12]				
Calcium	10/10	1,000	184.5* to 1,790	445	402	NA	No[13]				
Chromium	10/10	2	2.7 to 19.6	7.9	10.8	100	No[11]				
Cobalt	6/10	0.33 to 10	0.35 to 3.4	1.5	3	20	No[11]				

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

Remedial Investigation Report
Site 11, Southeast Open Disposal Area (B) (Landfill)
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Milton, Florida

Analyte	Frequency of Detection[1]	Range of Reporting Limit	Range of Detected Concentration[2]	Average of Detected Concen-trations[3]	Background Screening Concen-tration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Inorganic Analytes (mg/kg)											
Copper	8/10	5	3.7 to 19.4	7.2	9.4	50	No[11]				
Cyanide	5/10	0.23 to 0.5	0.09 to 0.19	0.12	0.26	NA	No[12]				
Iron	10/10	20	1,500 to 11,700	5,250	8,588	NA	No[13]				
Lead	18/18	0.6 to 1	5.2 to 2,230	146	11.4	50	Yes	166	146	166	146
Magnesium	10/10	1,000	54.2 to 1,260	214	258	NA	No[13]				
Manganese	10/10	3	31.4 to 280*	126	404	NA	No[12]				
Mercury	6/10	0.1	0.04 to 0.08	0.05	0.12	0.5	No[11,12]				
Nickel	4/10	2.3 to 8	1.6 to 10	3.9	7.2	50	No[11]				
Potassium	8/10	128 to 1,000	62.1 to 166	111	177	NA	No[12,13]				
Selenium	1/10	0.44 to 1	0.16 to 0.16	0.16	0.44	NA	No[12]				
Silver	5/10	2	0.55 to 1.9	1	0.7	NA	Yes	1.3	1	1.3	1
Sodium	10/10	1,000	160 to 307	188	388	NA	No[12,13]				
Vanadium	10/10	10	4.4 to 20.3	12.9	21.2	NA	No[12]				
Zinc	10/10	4	5.7 to 260	40.5	15.4	200	Yes	124	40.5	124	40.5
Other (mg/kg)											
Total petroleum hydrocarbons	5/5	1.8 to 1.9	7 to 53.1	17.9	ND	NA	Yes	NC	17.9	53.1	17.9

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern for Surface Soil Associated with Site 11

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Site 11, Southeast Open Disposal Area (B) (Landfill)
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[1] *Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed (excluding rejected values).*
[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the detection limit is used as a surrogate for the nondetect value.
[3] The average of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples. Background screening values for organic analyte values are one times the average of detected concentrations. Organic values are included for comparison purposes only (i.e., not used to select ecological contaminant of potential concerns).
[5] The ecological screening values are the Dutch Soil Criteria as reported in the U.S. Fish and Wildlife Service Biological Report 1990(2), "Evaluating Soil Contamination," (Beyer, 1990).
[6] These chemicals are retained for further evaluation in the ecological risk assessment.
[7] The 95th percent upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA *Supplemental Guidance to RAGS: Calculating the Concentration Term.* The 95 percent UCL is not calculated when there are less than 10 total samples. (USEPA,1992f)
[8] The average of all samples assigns a value of one-half of the detection limit as a surrogate concentration for nondetect values.
[9] The reasonable maximum exposure point concentration (EPC) is equal to the lesser of the maximum detected concentration or the 95th percent UCL.
[10] The central tendency (CT) EPC is equal to the lesser of the average of all samples or the maximum exposure point concentration.
[11] The maximum detected concentration is less than the ecological screening value.
[12] The maximum detected concentration is less than the background screening concentration.
[13] The analyte is an essential nutrient and not considered toxic.

Notes: The average of a sample and its duplicate is used for all table calculations.
Samples: Samples 11-SL-01, 11-SL-02, 11-SL-03, 11-SL-04, 11-SL-05, 11S00101, 11S00201, 11S00301, 11S00401, and 11S00501 were analyzed for VOCs, SVOCs, pesticides and PCBs, and inorganics. Samples 11S00601, 11S00701, 11S00801, 11S00901, 11S01010, 11S01101, 11S01201, and 11S01301 were analyzed for lead only. Samples 11S00101, 11S00201, 11S00301, 11S00401, and 11S00501 were analyzed for TPH only.
Duplicate samples: 11-SL-01A and 11S00601D.
Background samples: BKG-SL-02, BKG-SL-06, and BKG-SL-07.
Background duplicate samples: BKSS00201D.

* = average of sample and duplicate.
μg/kg = micrograms per kilogram.
NA = not available.
DDT = dichlorodiphenyltrichloroethane.
DDE = dichlorodiphenyldichloroethene.
% = percent.
SVOC = semivolatile organic compound.
NC = not calculated
ND = not detected in any background sample.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
mg/kg = milligrams per kilogram.
RME = reasonable maximum exposure.
VOC = volatile organic compounds.
TPH = total petroleum hydrocarbon.

potential exposure pathways that exist at Site 11 for each group of receptors. Additional details regarding the exposure assessment is provided in the GIR (ABB-ES, 1998).

7.4.1 Calculation of EPCs The EPC is a representative concentration used for evaluating risks throughout this ERA. RME and Central Tendency (CT) concentrations are derived for each ECPC. If the sample size is greater than or equal to ten, the RME value is equal to the lesser of the maximum detected concentration and the 95th percent upper confidence limit (UCL) calculated on the log-transformed arithmetic mean (USEPA, 1992f). One-half of the detection limit is used to calculate the 95th percent UCL. If the sample size is less than or equal to nine, the RME concentration is equal to the maximum detected concentration. If potential risks are predicted based on the RME scenario, then the CT exposure scenario is also evaluated. The CT exposure concentration is represented by the arithmetic mean of all samples. One-half of the detection limit is also used as a surrogate value for sample results that are below the detection limit.

With the exception of TPH, 10 or more surface soil samples were collected for all constituents at Site 11. For all constituents except TPH, the lesser of the maximum detected concentration and the 95th percent UCL is used as the RME concentration (USEPA, 1992f). Because TPH was analyzed in only five samples, the RME concentration for TPH is equal to the maximum detected concentration. Table 7-2 presents the RME and CT EPCs for the selected ECPCs.

7.4.2 Terrestrial Wildlife Exposure routes for wildlife receptors include direct and indirect ingestion of soil and ingestion of food containing site-related chemicals. The actual amount of an ECPC taken in by wildlife species (i.e., ingestion dose in milligrams per kilogram per day depends on a number of factors. A potential dietary exposure (PDE) model is used to estimate exposure to representative wildlife species. The PDE (or body dose) is calculated for each ECPC in surface soil using the equations presented in Table 7-3 and the methodologies described in the GIR (ABB-ES, 1998). The PPE is calculated based on the estimated concentrations of the ECPCs in food items that the species would consume; the amount of surface soil that it would ingest; the relative amount of different food items in its diet, body weight, and the food ingestion rate.

Wildlife species from different trophic guilds that may be present at the site were selected for the PDE model. The model uses species-specific feeding and habitat characteristics to estimate chemical exposures to wildlife species relative to their position in the food chain. Terrestrial receptors were chosen to represent the trophic levels typically found in the southeastern pine flatwoods and disturbed upland communities present at Site 11. The representative wildlife species considered in the ERA are summarized in Table 7-4 and discussed below.

- **Cotton mouse** (*Peromyscus gossypinus*). The cotton mouse represents a small mammalian herbivore that could potentially be exposed to contamination in soil and in plant tissue (accumulated from the soil). The cotton mouse home range is estimated at 0.147 acre and could reside entirely on the site. The cotton mouse represents the small mammal herbivore community at Site 11.

Table 7-3
Estimation of Potential Chemical Exposures for Representative Wildlife Species

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Estimation of Chemical Exposures Related to Surface Soil

Scope: Estimates the amount (dose) of a chemical ingested and accumulated by a species via incidental ingestion of surface soil and food items containing site-related chemicals.

Soil Chemical Concentration: The maximum detected concentration of the ecological chemicals of potential concern when the sample size is ≤ 9, and the lesser of the maximum detected concentration or the 95th percent upper confidence limit when the sample size is ≥ 10.

Soil Exposure Concentration:

$$\underset{(mg/kg)}{\textit{Soil Exposure}} = \left(\textit{\% of Diet as Soil} \times \underset{(mg/kg)}{\textit{Soil Concentration}} \right)$$

Primary Prey Item Concentration (TN_1)

$$\underset{(mg/kg)}{\textit{Primary Prey Item Concentration}} = \left(BAF_{inv\ or\ plant} \times \underset{(mg/kg)}{\textit{Soil Concentration}} \right)$$

Secondary Prey Item Concentration (TN_2):

$$\underset{(mg/kg)}{\textit{Secondary Prey Item Concentration}} = \left(BAF_{mam\ or\ bird} \times \underset{(mg/kg)}{\textit{Tissue Concentration of Primary Prey Items}^{*}} \right)$$

where BAF = bioaccumulation factor or mg/kg fresh weight tissue over mg/kg dry weight soil for invertebrates and plants, and mg/kg fresh weight tissue over mg/kg fresh weight food for small mammals and small birds.

* For a discussion of the weighted chemical concentration in prey items, see explanation of the PDE term below, and the General Information Report (ABB-ES, 1998)

Total Exposure Related to Surface Soil:

$$\underset{(mg/kgBW\text{-}day)}{PDE} = \frac{[P_1 \times T_1 + \ldots + P_N \times T_N + \textit{soil exposure}] \times IR_{Diet} \times SFF \times ED}{BW}$$

where
- PDE = potential dietary exposure (mg/kgBW-day),
- P_N = percent of diet composed of food item N,
- T_N = tissue concentration in either the primary or secondary prey item N_1 and N_2, respectively (mg/kg),
- IR_{Diet} = food ingestion rate of receptor (kg of food or dietary item per day),
- BW = body weight (kg) of receptor,
- SFF = site foraging frequency (site area [acres] divided by home range [acres]), assumed to be equal to 1 for lethal exposure scenario, and
- ED = exposure duration (fraction of year species is expected to occur on site)

Notes: ≤ = less than or equal to.
≥ = greater than or equal to.
mg/kg = milligrams per kilogram.
% = percent.
BAF = bioaccumulation factors.
inv = invertebrate species
mam = mammal species.
mg/kg BW-day = milligrams per kilogram of body weight per day.
kg = kilograms.

Table 7-4
Ecological Receptors Evaluated
For Surface Soil

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Receptor Evaluated		Method of Evaluation
Common Name	Scientific Name	
Terrestrial Plants	Lettuce seed (*Lactuca sativa*)	Toxicity testing of surface soil
Terrestrial Invertebrate	Earthworms (*Eisenia foetida*)	Toxicity testing of surface soil
Cotton mouse	*Peromyscus gossypinus*	Food-web model
Short-tailed shrew	*Blarina brevicauda*	Food-web model
Eastern meadowlark	*Sturnella magna*	Food-web model
Red fox	*Vulpes vulpes*	Food-web model
Great horned owl	*Bubo virginianus*	Food-web model

- **Short-tailed shrew** (*Blarina brevicauda*). The short-tailed shrew finds suitable habitat in forests, fields, marshes, and brush. It primarily feeds on earthworms, snails, centipedes, insects, small vertebrates, and slugs (DeGraaf and Rudis, 1986). Insectivorous species may receive relatively high chemical doses of bioaccumulating compounds as a result of their voracious appetites. The shrew has an estimated home range of 0.96 acres and represents small omnivorous mammals that may be found in the old field portion of Site 11.

- **Eastern meadowlark** (*Sturnella magna*). The eastern meadowlark is most commonly found in open pastures, prairies, farms, and meadows and has a home range of approximately 5 acres. The meadowlark feeds primarily on invertebrates, although its diet is supplemented with plants. The meadowlark represents insectivorous avian receptors found in open areas of Site 11 (DeGraaf and Rudis, 1986).

- **Red Fox** (*Vulpes vulpes*). This omnivorous mammal prefers open woodlands and grassy fields and is most active at night and twilight. It is an opportunistic forager, feeding on small mammals, birds, amphibians, reptiles, invertebrates, berries, and other fruits (Burt and Grossenheider, 1976). The red fox has an estimated home range of approximately 250 acres and represents the large predatory mammal guild at Site 11.

- **Great Horned Owl** (*Bubo virginianus*). The great horned owl is primarily a nocturnal hunter of small mammals. Its habitat includes deep woods and heavily wooded swamps often near open country where it may hunt for primary prey items consisting of small mammals and birds (DeGraaf and Rudis, 1986). The great horned owl home range is approximately 15 acres. The owl represents the predatory avian carnivores of both the open and forested areas of Site 11.

Parameters for quantitatively evaluating exposures to wildlife include body weight, food ingestion rate, home range, and relative consumption of food items. Exposure assumptions for each of the representative wildlife species for Site 11 are provided in Table 7-5 and Table F-4 of Appendix F. In addition to these parameters, the species foraging habits and bioaccumulation in food items are also considered.The Site Foraging Frequency (SFF) considers the frequency a receptor feeds within the site area by estimating the acreage of the site relative to the receptor's home range, and by considering the fraction of the year the receptor would be exposed to site-related chemicals (i.e., the exposure duration). By definition the SFF cannot exceed 1. The area of Site 11 (approximately 3 acres) is larger than the home range for the cotton mouse and short-tailed shrew and smaller than the home range for the Eastern meadowlark, red fox, and great horned owl. Because all representative wildlife species are expected to actively forage at the site year round, it is assumed that the exposure durations for these organisms are 1.

Wildlife species may be exposed to ECPCs in surface soil via incidental ingestion of soil or by ingesting prey items that have bioaccumulated these ECPCs. To estimate this exposure, a PDE is estimated for all representative wildlife species for each ECPC according to the equations in Table 7-3.

Prey items for wildlife species in the food-web exposure models include invertebrates and plants as well as small mammals and birds. BAFs are used in the wildlife exposure model to estimate the transfer of chemicals between soil and plants or soil invertebrates and between these organisms and primary consumer species. To estimate the PDE, tissue concentrations of ECPCs in prey items are estimated using BAFs for surface soil. BAFs for most receptors are extrapolated from literature values or estimated using regression equations from scientific literature. Based on the evidence provided in several reference materials (Suter, 1993; Maughan, 1993), an assumption is made that VOCs do not bioaccumulate in prey tissue. The general approach used to select BAFs for Site 11 is summarized in Table 7-6.

BAFs for invertebrate and plant food items are defined as the ratio of the ECPC concentration in plant or invertebrate tissue (mg chemical/kg tissue wet-weight) to the ECPC concentration in surface soil (mg chemical/kg dry-weight soil). BAFs reported in the scientific literature for avian and mammalian receptors are the reported ratios of ECPC concentrations in the tissues of these receptors (mg chemical/kg tissue wet-weight) to the concentrations of ECPCs in their food items (mg chemical/kg tissue wet-weight). BAFs for each of the ECPCs evaluated at Site 11 are included in Table F-1 of Appendix F.

For each representative wildlife species, the estimated percentage of soil in the overall diet is multiplied by the concentration of each ECPC in the soil and the food ingestion rate (kilograms per day [kg/d]) to determine the soil exposure concentration.

<u>7.4.3 Terrestrial Plants and Invertebrates</u> Terrestrial plants and invertebrates may be exposed to ECPCs via direct contact with and root uptake (plants) or ingestion (invertebrates) of ECPCs measured in Site 11 surface soil. For the purposes of the Site 11 ERA, exposures to terrestrial plants and invertebrates are assumed to occur within the top one-foot-interval of surface soil. Exposure of terrestrial plants to groundwater is not evaluated because the depth to the water table is approximately 44 to 90 feet bls (see hydrogeological discussion in Chapter 5.0 of this report).

Table 7-5
Exposure Parameters for Representative Wildlife Species

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Representative Wildlife Species	Body Weight (kg)	Reported Diet	Assumed Diet for Terrestrial Exposure Assessment (% of diet)	Food Ingestion Rate (kg/day)	Home Range (acres)
Cotton mouse [a] (*Peromyscus gossypinus*)	0.021 [b]	Seeds and some insects. [c]	88% Plants 10% Invertebrates 2% Soil [d]	0.0029 [e]	0.147 [f]
Short-tailed shrew (*Blarina brevicauda*)	0.017 [g]	Earthworms, slugs, snails, fungi, insects, and vegetation. [c]	78% Invertebrates 12% Plants 10% Soil [c]	0.0024 [e]	0.96 ± 0.09 [c]
Eastern meadowlark (*Sturnella magna*)	0.087 [h]	Insects, seeds, and invertebrates (beetles, grubs, bugs, grasshoppers, crickets, ants, and spiders) [h]	75% Invertebrates 20% Plants 5% Soil [h]	0.0119 [j]	5 [h]
Red fox (*Vulpes vulpes*)	4.69 [c]	Small mammals, birds, and invertebrates, as well as berries and other fruits. [c]	57% Small mammals 20% Invertebrates 10% Small birds 10% Plants 3% Soil [c]	0.24 [e]	250 [c]
Great horned owl (*Bubo virginianus*)	1.5 [i]	Mostly rabbits, mice, rats, squirrels, birds, bats, snakes, frogs, crayfish, and grasshoppers [i]	80% Small mammals 19% Small birds 1% Soil [c]	0.078 [j]	15 [k]

References:

[a] Values for the deer mouse were used for the cotton mouse (U.S. Environmental Protection Agency [USEPA], 1993b).
[b] Average of adult male and female deer mice in North America (USEPA, 1993b).
[c] Based on average exposure parameters cited in *Wildlife Exposure Factors Handbook* (USEPA, 1993b).
[d] Average of the deer mouse value is used for cotton mouse based on similarities in diet. Other values were based on diet composition (USEPA 1993b).
[e] Calculated using the mammal equation based on body weight (Wt) in kg. Food ingestion (kg/day) = 0.0687 x Wt $^{0.822}$ (kg) (USEPA, 1993b).
[f] Average for male and female deer mice, Virginia/mixed deciduous forest (USEPA, 1993b).
[g] Mean of means reported for male and female shrews in summer and fall (USEPA, 1993b).
[h] Terres (1980).
[i] DeGraaf & Rudis (1986).
[j] Calculated using the bird equation based on body weight (Wt) in kg. Food ingestion (kg/day) = 0.0582 x Wt $^{0.651}$ (kg) (USEPA, 1993b).
[k] Great horned owl home range taken from low end of range in southeast Madison County, N.Y. (Hager, 1957).

Notes: kg = kilograms.
% = percent.
kg/day = kilograms per day.
± = plus or minus.

Table 7-6
Estimation of Bioaccumulation Factors

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Receptor Group	Nature of Approach	General Approach
Terrestrial Plants Unit: mg/kg wet tissue per mg/kg dry soil	Literature Values	When available, literature values were used to estimate plant BAFs.
	Extrapolation and Empirical Data	When literature values were not available, plant BAFs for inorganic compounds were obtained from Baes et al. (1984).[1]
	Assumption	Although evidence suggests that plants may transport organic analytes with log K_{ow}s < 5 (i.e., volatile organic compounds [VOCs]) from the roots into leafy portions (Briggs et al., 1982; Briggs et al., 1983), bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that transfer of VOCs from plant tissue to animal tissue does not occur.
Terrestrial Invertebrates Unit : mg/kg wet tissue per mg/kg dry soil	Literature Values	When no specific values were available, literature values were used to estimate BAFs for invertebrates.
	Assumption	Bioaccumulation data for VOCs is generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that soil invertebrates do not bioaccumulate VOCs.
Small Mammals Unit : mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small mammals.
	Extrapolation and Empirical Data	When literature values were not available, BAFs for small mammals for inorganics were derived from ingestion-to-beef biotransfer factors (BTFs) presented in Baes et al. (1984)[2].
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it is assumed that small mammals do not bioaccumulate VOCs.
Small Birds Unit: mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small birds.
	No Information	BAFs were not obtained for SVOCs or for inorganic compounds as there is little bioaccumulation data available for birds. It is assumed that small birds do not accumulate VOCs.

[1] BAFs derived from Baes et al. (1984). Values are based on analysis of literature references, correlations with other chemical and physical parameters, or comparisons of observed and predicted elemental concentrations in vegetative and reproductive plant material and soil. Data are based on dry weight and were converted to a fresh weight basis assuming that plants are 80 percent water. This is generally consistent with the water content of berries (82 to 87 percent water) and leafy vegetables (87 to 95 percent water), presented in Suter (1993). Grains contain a much lower percentage of water (approximately 10 percent); therefore, this assumption likely underestimates exposure to graminivores.
[2] BTFs were converted to a BAF (mg/kg tissue divided by mg/kg food) by multiplying by a food ingestion rate of 12 kg (dry weight) per day (average intake for lactating and nonlactating cattle reported in Travis and Arms, 1988).

Notes: mg/kg = milligrams per kilogram.
BAFs = bioaccumulation factors.
kg = kilogram.
Log K_{ow} = Logarithmic expression of the octanol-water partition coefficient.
< = less than.
BTF = biotransfer factor.

7.5 ECOLOGICAL EFFECTS ASSESSMENT. The ecological effects assessment discusses what measurement endpoints were used to evaluate potential adverse impacts to the assessment endpoints (i.e., the survival and maintenance of receptor populations). The methods used for identifying and characterizing ecological effects for ECPCs in surface soil are described in the following subsections and in greater detail in Subsection 2.4.4 of the GIR (ABB-ES, 1998).

Wildlife receptors, terrestrial plants, and terrestrial invertebrates are potentially exposed to ECPCs in surface soil at Site 11. The measures of adverse ecological effects for these receptors are discussed separately.

7.5.1 Terrestrial Wildlife As identified in the problem formulation, the assessment endpoint selected for terrestrial wildlife is the survival and maintenance of wildlife populations and communities within the habitats present at Site 11. Because no long-term wildlife population data are available at NAS Whiting Field, a direct measurement of this assessment endpoint is not possible. The literature-derived results of laboratory toxicity studies that relate the dose of a chemical in an oral exposure with an adverse response to growth, reproduction, or survival of a test population (avian or mammalian species) are used as a measure of the assessment endpoint. Wildlife ingestion toxicity data are presented in Appendix F, Table F-2.

Reference toxicity values (RTVs) are derived for each ECPC and representative wildlife species according to the data hierarchy presented in *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, Interim Final (USEPA, 1997d). The RTV represents the lowest exposure level (e.g., concentration in the diet) shown to produce adverse effects (e.g., reduced growth, impaired reproduction, increased mortality). For each ECPC, two RTVs representing lethal and sublethal effects are selected for each representative wildlife species. Lethal effects are those that result in mortality while sublethal effects are those that impair or prevent reproduction or growth. The RTVs are assumed to be a measure of the assessment endpoints for the protection of the survival, growth, and reproduction of terrestrial wildlife populations. Lethal RTVs are developed using the data hierarchy below and discussed in items 1, 2, and 3, while sublethal RTVs are derived using the methodology discussed in items 1 and 2.

1) For contaminants with well-documented adverse effects, the highest exposure level that is a no observed adverse effect level (NOAEL) is selected as the RTV.

2) If NOAEL values are not available, one-tenth of the lowest observed adverse effect level (LOAEL) is selected as the RTV.

3) If NOAEL or LOAEL values are not available, the lowest reported oral LD_{50} (oral dose [in mg/kg body weight-day] lethal to 50 percent of a test population) is used to derive the lethal RTV. The lethal RTV is one-fifth of the lowest reported LD_{50} value for the species most closely related to the representative wildlife receptor. One-fifth of an oral LD_{50} value is considered to be protective against lethal effects for 99.9 percent of individuals in a test population (USEPA, 1986b). An assumption is made that the value represented by one-fifth of an oral LD_{50} would be protective of 99.9 percent of the individuals within the

terrestrial wildlife populations and represents a level of acceptable risk.

A summary of lethal and sublethal RTVs selected from the ingestion toxicity data is provided in Table F-3 of Appendix F.

If neither lethal nor sublethal toxicity information is available for a taxonomic group, no RTVs are identified and risks associated with the respective ECPC are not quantitatively evaluated. However, the absence of specific data for a taxonomic group does not imply that there is no toxicological effect associated with contaminant exposure by these receptors; therefore, potential risks to these taxonomic groups are qualitatively discussed in the Uncertainties Section (Section 7.7).

7.5.2 Terrestrial Plants and Invertebrates The assessment endpoints selected for terrestrial plants and soil invertebrates are survivability and growth of terrestrial plant and soil invertebrate communities as well as reduction in the biomass of terrestrial plants and abundance of soil invertebrates used as forage material. The toxicity of surface soil at Site 11 was measured using two soil laboratory toxicity tests including a 30-day survival and growth test with earthworms (*Eisenia foetida*) and a 120-hour lettuce seed (*Lactuca sativa*) germination test.

Surface soil samples (samples 11N00201, 11N00301, 11N00401, and 10N00501) for toxicity testing were collected from four locations at Site 11 and two reference soil samples (sample BKN00301 and its duplicate sample BKN00301D and sample BKN00101) from uncontaminated sites at NAS Whiting Field . The Site 11 and reference soil samples were collected concurrently with surface soil samples (11S00201, 11S00301, 11S00401, 11S00501, BKNS00301, and BKNS00101) for chemical analyses and represent split samples. Therefore, the results of the chemical analyses can be used to establish contaminant exposure concentrations and provide the means to interpret responses in the bioassays. If adverse effects were observed in either of the bioassays, simple linear regressions were completed to determine if a correlation(s) exists between the concentration of an analyte and the adverse response measured in the bioassay.

The results of the earthworm and lettuce seed toxicity testing of surface soil samples from Site 11 are presented in Table 7-7. Additional information on the toxicity testing of Site 11 surface soil with *E. foetida* and *L. sativa* is included in Appendix F of the GIR (ABB-ES, 1998).

Because the earthworm survival and lettuce seed germination data in the reference sample, BKN00101, were significantly different ($P \leq 0.05$) than the reference location, BKN00301, and data from sample BKN00301 were not significantly different from the laboratory control, toxicity data from BKN00101 were not included in the statistical comparison of site-related data and control/reference data. Site-related toxicity data were evaluated by a statistical comparison of mean survival, growth (as wet weight), or germination with the reference sample (BKN00301 and BKN00301D) and the laboratory control.

With the exception of one soil sample (11N00201), the soil samples collected at Site 11 were not toxic to earthworms. Earthworms exposed to soil collected at 11N00201 for 30 days experienced 77 percent mortality. There were no significant differences ($P \leq 0.05$) in the growth of earthworms between the reference and laboratory control samples and the Site 11 samples after 30 days of exposure. There were also no significant differences ($P \leq 0.05$) in germination of lettuce seeds between the reference and laboratory control samples and the Site 11 samples following 120 hours of exposure.

Table 7-7
Results of Site 11 Surface Soil Toxicity Testing

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Sample Location	Earthworm (*Eisenia foetida*)		Lettuce Seed (*Lactuca sativa*)
	Survival After 14 days (30 days) (%)	Weight Change (%)[1]	Germination After 120 Hours (%)
11N00201	100 (23)*	11.8	94
11N00301	100 (100)	4.6	91
11N00401	100 (100)	5.2	91
11N00501	100 (100)	7.2	86
Laboratory Control	100 (81)	13	91
BKN00301 (Reference)	100 (100)	10.9	97
BKN00301D (Reference)	100 (100)	5.0	90
BKN00101 (Reference)	100 (63)*	29.1	43*

[1] Growth of *E. foetida* is expressed as mean individual wet weight.

Notes: * = significantly different from the laboratory control and reference BKN00301.
% = percent.

<u>7.6 RISK CHARACTERIZATION</u>. This section presents the risk characterization for ecological receptors exposed to affected surface soil at Site 11. Potential risks associated with exposures to ECPCs in surface soil at Site 11 are discussed separately for wildlife, terrestrial plants, and soil invertebrates. Risks to wildlife are characterized by comparing the PDE concentrations (based on RME and CT exposure concentrations) for each surface soil ECPC with its respective RTV (estimated threshold dose for toxicity). Risks for terrestrial plants and soil invertebrates are evaluated by comparing toxicity benchmarks to RME and CT exposure concentrations.

<u>7.6.1 Terrestrial Wildlife</u> Risks for the representative wildlife species associated with ingestion and bioaccumulation of ECPCs in surface soil and prey items are quantitatively evaluated using HQs. HQs are calculated for each ECPC by dividing the PDE concentration by the selected lethal and sublethal RTV. HIs are determined for each receptor by summing the HQs for all ECPCs. When the estimated PDE is less than the RTV (i.e., the HQ < 1), it is assumed that chemical exposures are not associated with adverse effects to receptors and no risks to wildlife populations exist. For instance, if the PDE calculated using the RME concentration is less than the lethal RTV, then it is assumed that adverse effects to the survival of wildlife populations are unlikely to occur. Similarly, if the reasonable maximum PDE is less than the sublethal RTV, then it is assumed that adverse effects to wildlife populations related to growth and reproduction are unlikely to occur. When an HI is greater than or equal to 1,

a discussion of the ecological significance of the HQs comprising the HI is completed and risks from exposure to CT concentrations of ECPCs are evaluated.

This hazard ranking scheme evaluates potential ecological effects to individual organisms and does not evaluate potential populationwide effects. Contaminants may cause population reductions by affecting birth and mortality rates, immigration, and emigration (USEPA, 1989c). In many circumstances, lethal or sublethal effects may occur to individual organisms with little population- or community-level impacts; however, as the number of individual organisms experiencing toxic effects increases, the probability that population effects will occur also increases. The number of affected individuals in a population presumably increases with increasing HQ or HI values; therefore, the likelihood of population-level effects occurring is generally expected to increase with higher HQ or HI values.

The lethal and sublethal HQs and HIs are calculated for each ECPC and each representative wildlife species. Tables F-5 through F-9 of Appendix F present the HQ and HI calculations. A summary of risks to representative wildlife receptors is provided in Table 7-8.

Table 7-8
Summary of HIs for Terrestrial Wildlife[1]

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Ecological Receptors	Lethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Central Tendency EPCs
Cotton mouse	0.071	1.5	0.55
Short-tailed shrew	0.15	4.5	2.2
Eastern meadowlark	0.07	3.5	1.8
Red fox	0.66	6.3	2.7
Great horned owl	0.43	20	9.5

[1] The information is a summary of the HIs presented in Tables E-4 through E-9 of Appendix E.

Notes: EPC = exposure point concentration.
HI = hazard index.

Summary HIs for representative wildlife species exposed to RME concentrations of ECPCs for lethal effects were less than 1; therefore, lethal risks are not predicted for these receptors (i.e., bioaccumulating chemicals are not sufficiently high to reduce survivability in small mammals and birds and in top predators).

Based on exposure to RME concentrations of ECPCs in the surface soil, sublethal risks are predicted for all representative wildlife species. The sublethal HIs for the short-tailed shrew (RME HI = 4.5 and CT HI = 2.2), Eastern meadowlark (RME HI = 3.5 and CT HI = 1.8), red fox (RME HI = 6.3 and CT HI = 2.7), and great horned owl (RME HI = 20 and CT HI = 9.5) are all above 1 based on RME and CT exposure concentrations. The primary contributor to the sublethal HIs for the short-tailed shrew and the meadowlark is 4,4'-DDD.

Dieldrin and lead are primary contributors to sublethal risks for the red fox, while 4,4'-DDD, 4,4'-DDT and alpha- and gamma-chlordane are the primary risk drivers for the great horned owl.

Based on the results of the 1992 Phase IIA and 1996 Phase IIB surface soil investigations at Site 11, it appears that elevated concentrations of 4,4'-DDD, 4,4'-DDT, dieldrin, and lead in the surface soil may be localized at sampling location 11-SL-02. 4,4'-DDD was detected only at location 11-SL-02 and maximum concentrations of 4,4'-DDT, dieldrin, and lead were also detected at location 11-SL-02 as compared to the other sampling locations.

In order to evaluate whether or not potential risks to wildlife receptors exist outside the immediate area of sampling location 11-SL-02, the RME exposure concentrations for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead were recalculated by excluding the concentrations of these analytes detected at 11-SL-02. The RME concentration for lead is equal to the 95th percent UCL because lead was analyzed in 17 additional samples, and the UCL is less than the maximum detected concentration. The RME concentration for 4,4'-DDD is not calculated because this pesticide was only detected at location 11-SL-02. The RME concentrations for 4,4'-DDT and dieldrin are equal to their maximum detected concentrations because these analytes were analyzed in only nine additional samples. The recalculated RME concentrations for the aforementioned analytes are as follows: 4,4'-DDD (not detected), 4,4'-DDT (0.045 mg/kg), dieldrin (0.044 mg/kg), and lead (37 mg/kg). The recalculated RME concentrations, excluding the data from location 11-SL-02, were then used to derive HIs via the food-web model. The sublethal HQs and HIs calculated using the revised RME exposure concentrations for each of the representative wildlife species are presented in Tables F-10 and F-11 of Appendix F.

Sublethal risks to small mammal and bird populations are not predicted based on the revised RMEs for 4,4'-DDD, 4,4'-DDT, dieldrin, and lead. Although sublethal HI for the Eastern meadowlark was 1.0, all HQ values for individual constituents were less than 1. Although adverse effects to individual small bids are possible at HI values of one, the likelihood of population-level effects are considered negligible. Sublethal HIs for the red fox (HI = 3.9) and the great horned owl (HI = 4.5) still exceed 1. The primary risk contributor for the fox is dieldrin; for the owl, the primary risk contributors are 4,4'-DDT, alpha-chlordane, and gamma-chlordane.

The results of the food-web modeling suggest that lethal risks to terrestrial wildlife at Site 11 are not expected. Sublethal risks to small mammals and birds and top predators associated with ingestion of pesticides (including 4,4'-DDD, 4,4'-DDT, dieldrin, alpha-chlordane, and gamma-chlordane) and lead in surface soil and related food items may occur. However, it appears that elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Because sublethal risks to small mammals and birds appear to be localized to one discrete location or "hot-spot," it is unlikely that the reproduction or growth of these wildlife populations would be impacted outside the immediate area of 11-SL-02. However, sublethal impacts to growth and reproduction of top predator populations are possible over the entire area of Site 11.

7.6.2 Terrestrial Plants After 120 hours of exposure to Site 11 surface soil, lettuce seed germination was not inhibited. As shown in Table 7-7, lettuce seed germination ranged from 86 to 94 percent in soil collected from Site 11 as compared to 91 percent in the laboratory control and 94 percent in the reference sample, BKN00301, and its duplicate BKN00301D. The results of the toxicity testing show that surface soil samples collected at Site 11 are not expected to impact the survival and growth of terrestrial plants. Consequently, reduction of plant biomass and/or plant cover at Site 11 and subsequent impacts to small mammal and bird populations are not expected to occur.

7.6.3 Terrestrial Invertebrates With the exception of one sample (11S00201), the soil samples collected at Site 11 were not toxic to *E. foetida*. Following 30 days of exposure, survival and growth of earthworms in samples 11S00301, 11S00401, and 11S00501 were not significantly different ($P \leq 0.05$) from the laboratory control or reference sample. Worms exposed to soil from station 11S00201 experienced 77 percent mortality. Based on the results of the toxicity testing, it is assumed that with the exception of soil at location 11S00201, the contamination present in surface soil at Site 11 does not present an unacceptable risk for terrestrial soil invertebrates.

Of the soil samples collected during the 1996 Phase IIB investigation (11S00101 through 11S00501), sample location 11S00201 is characterized by concentrations of TPH and 4,4'-DDT greater than any other surface soil sampling location. TPH was detected at 53.1 mg/kg and 4,4'-DDT was detected at 0.027 mg/kg at this location. Appendix F presents a series of simple linear regression analyses that evaluate statistical relationships between biological effects observed in the surface soil bioassays and concentrations of selected analytes in Site 11 surface soil. Selected analytes include TPH, bis(2-ethylhexyl)phthalate, 4,4'-DDT, dieldrin, lead, and zinc. These analyses suggest that concentrations of TPH and 4,4'-DDT are both positively correlated with earthworm mortality with the square of the product moment correlation coefficient through data points in known "y"s and known "x"s) (R^2) values of 0.99 (TPH) and 0.95 (4,4'-DDT). As concentrations of either TPH or 4,4'-DDT increase (at location 11S00201), earthworm survival rates decrease.

7.7 UNCERTAINTY ANALYSIS. The objective of the uncertainty analysis is to discuss the assumptions of the ERA process that may influence the risk assessment results and conclusions. Table 2.5 of the GIR presents several general uncertainties inherent in the risk assessment process (ABB-ES, 1998).

Specific uncertainties associated with exposure to surface soil at Site 11 include the following:

- Although selected as an ECPC for surface soil, TPH was not evaluated in the ERA for terrestrial wildlife (i.e., mammals and birds) because toxicological benchmarks were not available. TPH was detected in five samples collected during the Phase IIB investigation at concentrations ranging from 7 to 53.1 mg/kg. It is believed that detected concentrations of TPH are likely the result of past disposal activities at Site 11. Based on the detected concentrations of volatile and semivolatile constituents, and the finding of no risk associated with these constituents, it is unlikely that detected concentrations of TPH in the surface soil of Site 11 pose a risk to terrestrial wildlife receptors.

- Risks to avian species may have been underestimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with several ECPCs were not evaluated for avian species. If the toxicological and contaminant transport data obtained from studies conducted on mammals were used to estimate risks to avian species, then risk estimates for birds would be higher. However, there is also uncertainty in assuming that the metabolic functions of mammals and birds are similar enough to use intertaxonomic surrogates.

- Risks to adult amphibian and reptile species were not estimated because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with ECPCs are uncertain for these species. Intertaxonomic surrogates were not used to calculate dietary risks to reptiles because of the uncertainty associated with extrapolation of data from endothermic to essentially ectothermic species.

- An assumption has been made that organisms evaluated in the toxicity tests are representative of species at the site. Depending on the sensitivities of terrestrial plants and invertebrates occurring at Site 11, risks may be over or underestimated.

- Inclusion of the lead confirmatory samples in the EPC calculation may result in overestimation of risk.

7.8 SUMMARY OF ECOLOGICAL ASSESSMENT FOR SITE 11. Potential risks for ecological receptors including terrestrial wildlife, terrestrial plants, and soil invertebrates were evaluated for ECPCs in surface soil at Site 11.

Risks associated with exposures to ECPCs in Site 11 surface soil were evaluated for terrestrial wildlife based on a model that estimates the amount of contaminant exposure obtained via the diet and incidental ingestion of surface soil. Comparison of estimated doses for wildlife species with reference toxicity doses representing thresholds for lethal and sublethal effects is the basis of wildlife risk evaluation. Based on the results of the food-web model, lethal risks to terrestrial wildlife at Site 11 are not predicted. Sublethal risks to terrestrial wildlife associated with ingestion of pesticides and lead in surface soil and food items were identified; however, elevated concentrations of 4,4'-DDD and lead are localized in the immediate area surrounding sampling location 11-SL-02. Sublethal risks to small mammal and bird populations appear to be localized to location 11-SL-02 while impacts to top predator populations are predicted over the entire area of Site 11.

Risks to terrestrial plants and soil invertebrates at Site 11 were evaluated based on the results of laboratory toxicity testing of surface soil samples from Site 11 with earthworms (*Eisenia foetida*) and lettuce seeds (*Lactuca sativa*). With the exception of soil from sampling location 11S00201, soil collected from Site 11 was not toxic to the test species and risks associated with exposure to ECPCs in surface soil were not identified for soil invertebrates, terrestrial plants, or foraging mammal and bird populations. At location 11S00201, significant earthworm mortality (77 percent) was observed. It is likely that elevated TPH and 4,4'-DDT concentrations (53.1 and 0.27 mg/kg, respectively) may be at least partially responsible for the observed mortality in the laboratory toxicity tests.

In summary, the results of the ERA suggest that the growth and reproduction of small mammal and bird populations may be impacted in the area near sampling location 11-SL-02, while sublethal impacts to top predator populations are likely over the entire area of Site 11. Reductions in the biomass of terrestrial plants used as forage material at Site 11 are not expected. However, the survival of terrestrial invertebrates and consequent abundance for foraging mammals and birds may impacted at sampling location 11S00201.

7.0 ECOLOGICAL RISK ASSESSMENT

The Ecological Risk Assessment (ERA) evaluates actual and potential adverse effects to ecological receptors associated with exposure to chemicals from Site 16, the Open Disposal and Burning Area, at NAS Whiting Field. The ERA for Site 16 follows the methodologies described in the NAS Whiting Field GIR (HLA, 1998), and current guidance materials for ERAs at Superfund sites including the following:

- *Risk Assessment Guidance for Superfund Environmental Evaluation Manual* (USEPA, 1989b)

- *Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference* (USEPA, 1989c)

- *Framework for Ecological Risk Assessment* (USEPA, 1992b)

- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997b)

- Supplemental Guidance to RAGS: Region 4 Bulletins on Ecological Risk Assessment (USEPA, 1995c)

- *Proposed Guidelines for Ecological Risk Assessment* (USEPA, 1996c)

Risk assessment guidance included in the USEPA "Eco Update" bulletins (1991d, 1992e, and 1992f) and recent publications (e.g., Maughan, 1993; Suter, 1993) were also consulted.

This ERA was conducted to determine if ecological receptors are potentially exposed to contaminants from Site 16 at concentrations that could cause adverse ecological effects. The Site 16 ERA consists of the following eight subsections:

- Site Characterization (Section 7.1) describes current ecological conditions at the site,

- Problem Formulation (Section 7.2) establishes the goals and focus of the assessment and identifies major factors to be considered,

- Hazard Assessment and Selection of Ecological Chemicals of Potential Concern (ECPCs) (Section 7.3) reviews the analytical data and identifies chemicals present at the site that may pose ecological risks,

- Exposure Assessment (Section 7.4) identifies complete exposure pathways and quantifies the magnitude and frequency of exposure,

- Ecological Effects Assessment (Section 7.5) identifies potential adverse effects to ecological receptors associated with the chemicals of concern identified in Section 7.3,

- Risk Characterization (Section 7.6) integrates exposure and concentration-toxicity response information to derive a likely estimate of adverse effects,

- Uncertainties (Section 7.7) identifies assumptions of the ERA process that may influence the risk assessment conclusions, and

- Summary of Ecological Risk (Section 7.8).

7.1 SITE CHARACTERIZATION. NAS Whiting Field Site 16 is approximately 12 acres in size. The site is located in the southwest portion of NAS Whiting Field, approximately 350 feet west of the Wastewater Treatment Plant (see Figure 1-2). Site 16 was used as the facility's primary waste disposal area from 1943 to 1965. The disposed waste consisted of general municipal refuse and waste generated from aircraft operation and maintenance (including paints, paint-stripping wastewater, solvents, waste oil, and hydraulic fluids). PCB-contaminated transformer oil may also have been disposed of at the site. An estimated volume of 3,000 to 4,000 tons of waste was reportedly disposed of at the site annually (Geraghty and Miller, 1986). To reduce waste volume, the wastes were burned, using spent diesel fuel as an accelerant.

The topography of Site 16 slopes toward Clear Creek, which is located 450 feet west of the site. Although overland transport of surface water runoff toward Clear Creek is possible, most of the on-site rainfall infiltrates directly into the ground due to the silty sand soil at Site 16.

A less than 0.1 acre ephemeral wetland is located along the site's eastern boundary. Because much of the site was disturbed by the trench and fill operations, it is very likely that this wetland is the result of subsidence within an old trench. The ephemeral wetland area is shallow (less than 2 feet deep) and is recharged by storm water runoff, thus it remains dry for most of the year. The ephemeral wetland is not likely to provide suitable habitat for aquatic receptors. However, any standing water present may provide an occasional source of drinking water for small terrestrial animals (amphibians, reptiles, mammals, and birds).

As shown in the Site 16 vegetative cover map (Figure 7-1), the landfill area of Site 16 is characterized as planted pine forest. In addition to slash pine (*Pinus elliotti*) and long-leaf pine (*P. palustris*), other saplings, shrubs and herbaceous plants commonly found in the planted pine area and herbaceous layer of Site 16 include: Red maple (Acer rubrum), ragweed (*Ambrosia* sp.), broomsedge (*Andropogon* sp.), yellow buttons (*Balduina angustifolia*), Spanish needles (*Bidens bipinnata*), beauty berry (*Callicarpa americana*), Goldenaster (*Chrysopsis sp.*), rattle box (*Crotalaria sp.*), Florida beggarweed (*Desmodium tortusosum*), buttonweed (*diodia virginiana*), yellow hessamine (*Gelsemium sempervirens*), moss verbena (*Glandularia pulchella*), Bladder-pod (*Glottidium vesicarium*), cudweed (*Gnaphalium sp.*), buttermint (*Hyptis mutabilis*), morning glory (*Ipomoea cordatotriboba*), cypress-vine (*Ipomoea quamoclit*), red cedar (*Juniperus silicicola*), Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*lonicera japonica*), False loosestrife (*ludwigia sp.*), wireweed (*Polygonella gracilis*), Mexican clover (*Richardia brasiliensis*), willow tree (*Salix nigra*), yellow wood sorrel (Oxalis stricta), rustweed (*Polypremum procumbens*), oaks (*Quercus* spp.), blackberry vine (*Rubus* spp.), poison ivy (*Toxicodendron radicans*), yaupon holly (*Ilex vomitoria*), goldenaster (*Pityopis graminifolia*), common nightshade (*solanum americanum*), goldenrod (*solidago sp.*), verbena (*Verbena brasiliensis*), skunk

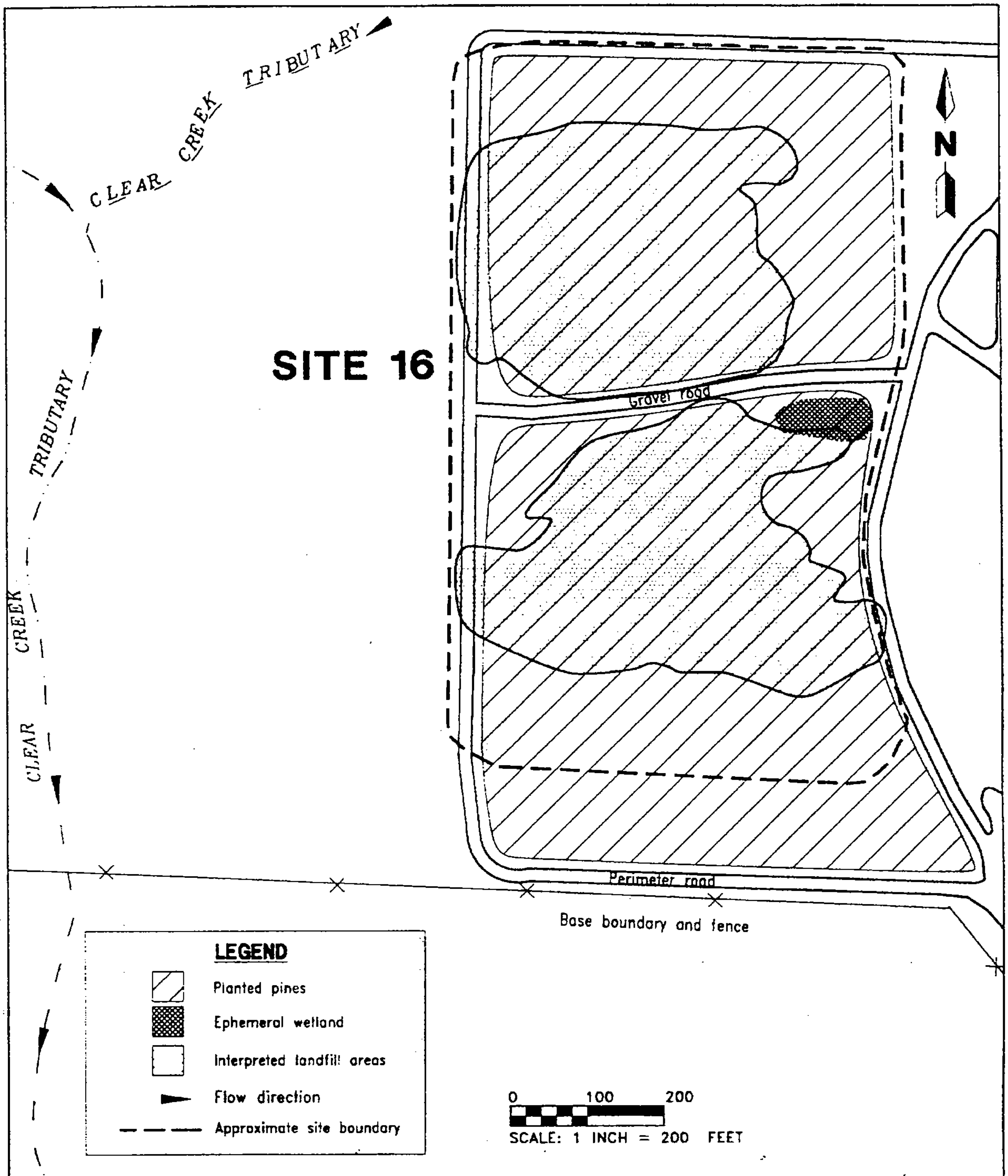

FIGURE 7-1
SITE 16, VEGETATIVE COVER MAP

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daisy (*verbesian enceliodies*), grape vine (*vitis sp.*) and greenbriar (*Smilax* spp.). A complete list of vegetative species occurring at Site 16 is provided in Appendix G of the GIR (HLA, 1998).

NAS Whiting Field maintains a program for planting and harvesting of pine trees, primarily long-leaf and slash pines. The planted pine area of Site 16 is subject to controlled burns and timber harvesting activities. As part of the ecosystem management plan, planted pine forests undergo periodic burning, usually once every four years, and selective thinning of long-leaf and slash pines every eight to ten years. These forestry management activities provide a variety of habitats and food sources for wildlife and other ecological receptors. Many of the pine trees were severely damaged or upturned during the 1995 hurricanes (Erin and Opal). Many of these trees were removed by base personal leaving large openings in the canopy. Site 16 is typical of uplands pine forests of the southeastern United States. The forested area at Site 16 is contiguous with a mature planted pine forest that surrounds the northern and southern boundaries of the site. A mowed grasses open area (area around the wastewater treatment plant) is located east of the site. NAS Whiting Field Site 39, Clear Creek Floodplain, is west of the site. The vegetative cover at Site 39 is characterized as a hardwood forested wetland.

Southeastern pine forests provide habitat for a diverse array of birds, including insectivorous gleaners of pine needles and bark, flycatchers, seed-eaters, and nocturnal and diurnal aerial predators (Wolfe et al., 1988). The pine flatwoods at and surrounding Site 16 are likely to host such an assemblage of species. Birds of prey, such as owls and hawks, may also nest in these wooded areas.

It is likely that the terrestrial invertebrate biomass at Site 16 serves as a forage base for a variety of wildlife species, including adult amphibians, reptiles, small birds, and small mammals. Small reptiles, mammals, and birds may use the forested pine area for protection. Predatory birds and mammals inhabiting the pine flatwood areas may also be attracted to the site.

Mammals and birds that may occur in the planted pine area of Site 16 include the hispid cotton rat (*Sigmodon hispidus*), cotton mouse (*Peromyscus gossypinus*), short-tailed shrew (*Blarina brevicauda*), American robin (*Turdus migratorius*), and eastern meadowlark (*Sturnella magna*). Predatory mammals and birds such as the red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), great-horned owl (*Bubo virginianus*), and the red-tailed hawk (*Buteo jamaicensis*) may also forage in the area of Site 16.

Site 16 groundwater may discharge to the surface water of Clear Creek, which is located approximately 450 feet downgradient and west of the site. Clear Creek, which is classified by the FDEP as Class III surface water, is a tributary to Blackwater River, located to the south. Florida Class III surface water are suitable for the propagation of fish and aquatic life. Blackwater River is classified as an Outstanding Florida River, which is considered to be of exceptional ecological significance. Groundwater discharge to the surface water of Clear Creek is qualitatively evaluated as part of the ERA for Site 16. However, the section of Clear Creek that receives groundwater from Site 16 is included as part of NAS Whiting Field Site 39, Clear Creek Floodplain. The ERA for Site 39 will present the results of surface water and sediment sampling in Clear Creek and provide further information on whether or not Site 16 is a potential source of contamination to Clear Creek.

7.2 PROBLEM FORMULATION. The problem formulation is the initial step of the ERA process. Problem formulation is composed of identification of receptors, identification of exposure pathways for those receptors, and selection of assessment and measurement endpoints based on information gathered from the site characterization.

7.2.1 Identification of Receptors Ecological receptors that may potentially utilize the available planted pine forest habitat at Site 16 include terrestrial wildlife (i.e., mammals, birds, reptiles, and adult amphibians), terrestrial plants, and soil invertebrates. Terrestrial flora and fauna potentially using NAS Whiting Field are identified in the GIR (HLA, 1998). Freshwater aquatic receptors in Clear Creek downgradient of Site 16 are evaluated in the ERA because groundwater from Site 16 may potentially migrate to the surface water of Clear Creek.

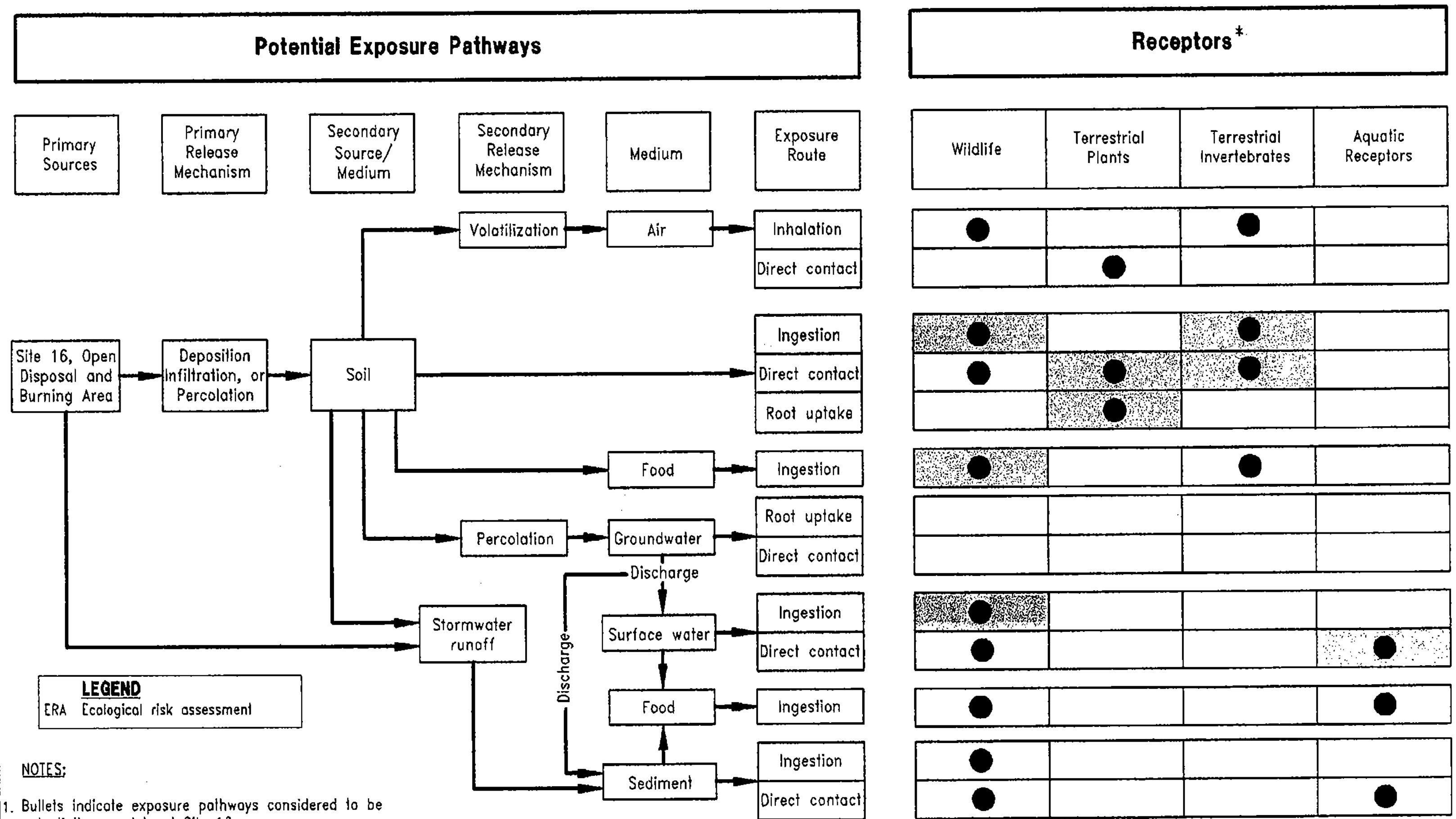
Certain species that potentially reside at NAS Whiting Field are protected by Federal and/or State laws. A list of state and federally protected species is provided in the GIR (HLA, 1998). Observations made during an ecological survey of NAS Whiting Field indicate that no state or federally listed rare, threatened, or endangered species or species of concern are known or likely to inhabit Site 16 (Nature Conservancy, 1997).

7.2.2 Identification of Exposure Pathways Exposure pathways are identified for four groups of receptors (terrestrial wildlife, terrestrial plants, soil invertebrates, and aquatic receptors). A complete exposure pathway includes a source of contamination, an exposure route, and a receptor. A conceptual model of the exposure pathways from source to ecological receptors is depicted in the contaminant pathway model on Figure 7-2.

All potential routes of exposure are considered in the ERA and are presented in the contaminant pathway model. The model differentiates between those exposure routes that are quantitatively evaluated and those that are qualitatively discussed. This limitation is necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur. Those pathways that cannot be quantitatively evaluated, due to a lack of toxicological information, are qualitatively discussed and addressed as uncertainties. The general approach used to identify exposure pathways for the four groups of receptors is explained below.

Terrestrial Wildlife. Terrestrial wildlife may be exposed to contaminants in surface soil, surface water, and food items contaminated as a result of ingestion, dermal adsorption, and inhalation of fugitive dust and volatile emissions.

The drinking water exposure pathway is expected to occur only occasionally, following periods of heavy rain. However, the ERA assumes that the surface water at Site 16 is used as the primary drinking water source for terrestrial wildlife throughout the year. Since the ephemeral wetland remains dry for most of the year, aquatic organisms are not expected to be present. Therefore, ingestion of aquatic food items (i.e., fish and aquatic invertebrates) by terrestrial organisms is not evaluated in the ERA. The Site 16 ERA will evaluate only exposures to surface soil, surface water, and food items potentially containing constituents that have bioaccumulated from the surface soil.



NOTES:

1. Bullets indicate exposure pathways considered to be potentially complete at Site 16.

2. Shading indicates the exposure pathways that are quantitatively evaluated for receptors in the Site 16 ERA. Nonshaded pathways are evaluated qualitatively. They were not evaluated quantitatively due to the lack of toxicity information or because they were not considered a significant pathway or data to quantatively evaluate these pathways are not available. The ingestion exposure routes for terrestrial invertebrates include the ingestion of soil and food items containing chemicals accumulated from Site 16 surface soil.

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FIGURE 7-2
CONTAMINANT PATHWAY MODEL FOR SITE 16 ECOLOGICAL RECEPTORS

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Dermal adsorption is considered to be a negligible exposure pathway relative to the ingestion pathway because the presence of fur, feathers, or a chitinous exoskeleton is likely to prevent contamination from coming in direct contact with the skin (personal communication with Ted Simon, USEPA Region IV, September 1997). In addition, soil trapped in the fur or feathers is likely to be ingested during grooming or preening activities, which are evaluated as part of the indirect ingestion exposure pathway.

Exposure via inhalation of fugitive dust is not likely to be a significant exposure pathway because the vegetation at Site 16 would limit the release of fugitive dust. Although volatile constituents were detected in the surface soil of Site 16, exposures associated with VOCs are not evaluated in the ERA because of the low detection frequency and concentration of VOCs in the surface soil. Neither toluene nor xylene, the only VOCs detected in surface soil, were retained as ECPCs. In addition, no evidence of burrowing animals and/or burrows was noted at Site 16 during the October 1995 biological field investigation conducted by HLA ecologists, although this habitat may be suitable to these receptors.

Potential contaminant exposures for reptiles and amphibians exist at NAS Whiting Field; however, ingestion toxicity data and bioaccumulation factors are generally not available for these receptors. Therefore, potential risks to reptiles and amphibians from ingestion of affected surface soil and food items will be qualitatively addressed in the Uncertainties Section (Section 7.7) of the ERA.

Terrestrial Plants and Invertebrates. Terrestrial plants and soil invertebrates may be exposed to contamination in surface soil by direct contact with and root uptake (plants) or ingestion (invertebrates) of soil. The ingestion exposure routes include the ingestion of soil and food items containing chemicals accumulated from Site 16 surface soil. The inhalation exposure route is not evaluated for terrestrial plants and invertebrates due to the reasons discussed above for terrestrial wildlife. Because the depth to groundwater is approximately 10 to 15 feet bls, which is below the root zone of most Site 16 plants, it is unlikely that terrestrial plants will be exposed to potential groundwater contamination. Terrestrial plants and soil invertebrates may also be exposed to contamination in subsurface soil by direct contact or ingestion of subsurface soil. However, this exposure pathway is only qualitatively evaluated as site-specific toxicity data are lacking (i.e., soil toxicity tests were not conducted using subsurface soil). In addition, there is uncertainty associated with comparing the surface soil screening benchmarks to concentrations detected in subsurface soil. The surface soil benchmarks employed in this assessment are based on laboratory toxicity tests, using sensitive species and species in their early life stages. It is unlikely that the most sensitive plant species and life stages would be exposed to subsurface soil.

Aquatic Receptors. Exposure pathways evaluated for aquatic receptors in Clear Creek downgradient of Site 16 (including invertebrates, plants, amphibians, and fish) include direct contact with groundwater (as it discharges to the surface water of Clear Creek). Although direct contact with the surface water and sediment and ingestion of sediment and food items is possible, these pathways will be evaluated as part of the ERA for Site 39, Clear Creek Floodplain.

A qualitative screening evaluation of Site 16 groundwater migration to surface water and potential adverse effects to aquatic receptors in Clear Creek will be completed as part of this ERA. It should be noted that the purpose of this evaluation is not to predict actual surface water and sediment conditions in Clear Creek. Surface water and sediment data from Clear Creek downgradient of Site 16 will be evaluated as part of the ERA for the Site 39, Clear Creek Floodplain.

<u>7.2.3 Identification of Endpoints</u> The assessment and measurement endpoints selected for the Site 16 ERA are listed in Table 7-1. Assessment endpoints represent the ecological component to be protected, whereas the measurement endpoints approximate or provide a measure of the achievement of the assessment endpoint. One of the assessment endpoints selected for the Site 16 ERA is the survival and maintenance of receptor populations and communities at Site 16. The measurement endpoints used to gauge the likelihood of population- and community-level effects are chemical-specific toxicological benchmark values derived from the literature that are based on laboratory-measured survival, growth, and reproductive effects. Table 7-1 presents the assessment endpoint, endpoint species, measurement endpoint, and decision point (i.e., the outcome at which additional evaluation may be warranted).

Three questions were developed to gauge potential risks associated with exposure to Site 16 surface soil and surface water. These questions are designed for multiple species and trophic levels and represent both individual and community dynamics. Questions for the Site 16 ERA are listed below.

1. ECPCs in the surface soil are not present at concentrations sufficiently high enough to reduce the survival and growth of terrestrial plant and invertebrate communities at Site 16.

2. ECPC concentrations in plants and invertebrates are not sufficiently high enough to adversely affect foraging small mammal or bird populations following consumption of contaminated prey.

3. Bioaccumulating chemical are not present at concentrations sufficiently high enough to reduce survivability, growth, or reproduction in top predators (e.g., foxes and owls).

<u>7.3 HAZARD ASSESSMENT AND SELECTION OF ECPCS</u>. The hazard assessment includes a review of analytical data and selection of ECPCs. ECPCs represent analytes detected in environmental media (i.e., surface soil, surface water, and groundwater) that are considered in the ERA and could present a potential risk for ecological receptors. The process for selecting ECPCs is depicted on Figure 7-3. Additional details regarding the ECPC selection process are provided in Subsection 2.4.2 of the GIR (HLA, 1998). Analytical data for Site 16 were evaluated and validated for use in risk assessment pursuant to national guidance, *Guidance for Data Useability in Risk Assessment (Parts A and B)* (USEPA, 1992a).

Following the data validation step, analytes in surface soil, surface water, and groundwater were not selected as ECPCs if the analyte was detected in 5 percent or fewer of the samples analyzed and not present in any other media. Calcium, magnesium, potassium, and sodium are excluded as ECPCs for surface water and groundwater. In addition to these analytes, iron is also excluded as an ECPC for surface soil. These analytes are considered to be essential nutrients and not toxic. The rationale for eliminating essential nutrients as ECPCs is provided in the GIR (HLA, 1998).

Table 7-1
Ecological Risk Assessment Endpoints Selected for Site 16

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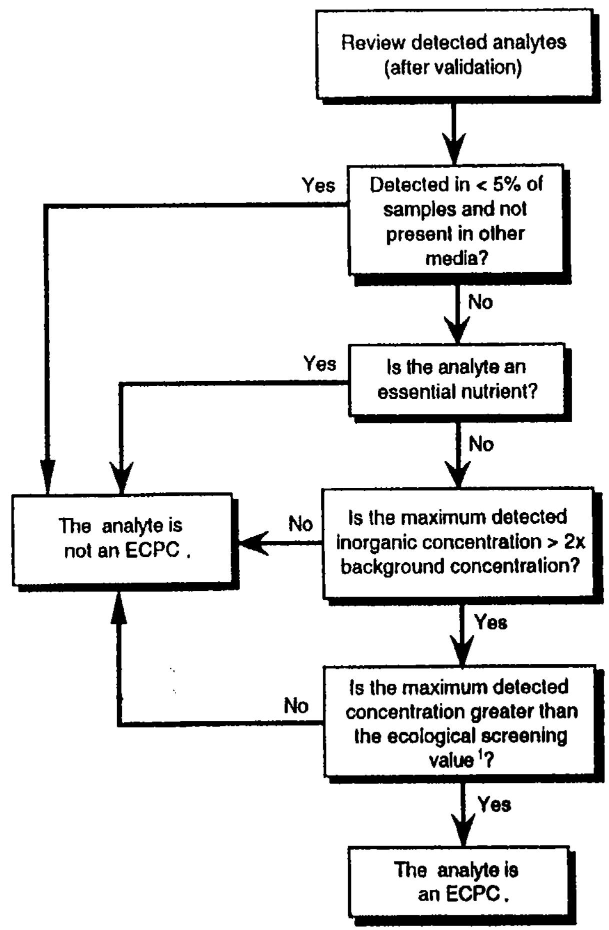
Assessment Endpoint	Receptor	Measurement Endpoint	Decision Point
Survival and growth of plant communities.	Terrestrial Plants	Germination of lettuce seeds exposed to surface soil samples from Site 16 in laboratory toxicity tests.	Significant differences ($P \leq 0.05$) in germination of lettuce seeds exposed to Site 16 surface soil samples as compared to control samples.
Survival and growth of terrestrial invertebrate communities.	Terrestrial Invertebrates	Survival and growth of earthworms exposed to surface soil samples from Site 16 in laboratory toxicity tests.	Significant differences ($P \leq 0.05$) in survival and/or growth of earthworms exposed to Site 16 surface soil samples as compared to control samples.
Survival and maintenance of wildlife populations.	Terrestrial Wildlife Species	Oral chemical doses (mg/kg BW/day) based on measured adverse effects on growth, reproduction, or survival (i.e., NOAEL, LOAEL, and LD_{50} studies) of mammalian or avian laboratory test populations.	Comparison of potential dietary exposures in mammalian and avian wildlife with literature-derived RTVs. (HQ >1 indicate potential risks.)

Notes: P = probability
$\leq$ = less than or equal to.
mg/kg = milligrams per kilogram.
BW/day = body weight per day.
NOAEL = no observed adverse effect level.
LOAEL = lowest observed adverse effect level.
LD_{50} = lethal dose to 50 percent of a test population.
RTV = reference toxicity value.
HQ = hazard quotient.
> = greater than.



NOTES:
NAS = Naval Air Station
ECPC = ecological chemical of potential concern
> = greater than
< = less than
x = times
[1] Media-specific ecological screening values include the Dutch Soil Criteria for surface soil ECPCs and the U.S. Environmental Protection Agency - Region 4 Surface Water Chronic Screening Values for groundwater.

FIGURE 7-3
ECOLOGICAL CHEMICAL OF POTENTIAL CONCERN SELECTION PROCESS

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Inorganic chemicals representative of background conditions are not selected as ECPCs. In accordance with USEPA Region IV guidance (USEPA, 1991a), an inorganic analyte is not selected as an ECPC if the maximum detected concentration is less than 2 times the average detected inorganic concentration in background samples.

The maximum detected concentrations are compared against representative site-specific background surface soil and groundwater concentrations to eliminate chemicals that are unlikely to be site related. Surface water data were not compared to background values because no comparable surface water background samples were available. The surface water at Site 16 is an isolated water body that was created as a result of excavation activities. Neither Big Coldwater Creek, Clear Creek, nor ponds in the area are similar to the ephemeral wetland at Site 16.

Site-specific background investigations of surface soil and groundwater were conducted at NAS Whiting Field, and the findings are presented in Subsections 3.3.1 and 3.3.3 of the GIR, respectively (HLA, 1998). The site-specific background study used to establish background screening values for Site 16 surface soil consists of nine surface soil samples (BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKS00101, BKS00201, BKS00301, BKS00401, and BKS00501) and one duplicate sample (BKS00201D). These samples were collected from Troup, Dothan, Lucy, and Bonifay soil types, which are considered the most geologically similar to the soil from Site 16. The site-specific background study used to establish background screening values for groundwater consists of seven groundwater samples (BKG00101, BKG00102, BKG00103, BKG00201, BKG00202, BKG00203, and BKG00301) and one duplicate sample (BKG00101D) collected from monitoring wells upgradient of any potential site-related contamination.

Analytes that exceed the background screening concentration and are not essential nutrients are also screened against ecological screening values for surface soil and groundwater. The surface soil ecological screening values are the Dutch Soil Criteria "A", which refer to background concentrations in surface soil issued by the U.S. Fish and Wildlife Service (Beyer, 1990). The groundwater ecological screening values are the fresh surface water chronic screening values for hazardous waste sites issued by USEPA Region IV (USEPA, 1995b). If the maximum detected concentration of an analyte for surface soil exceeds the respective ecological screening value, the analyte is retained as an ECPC for terrestrial wildlife, terrestrial plants, and soil invertebrates. Because ecological screening values are unavailable for surface water exposures to terrestrial wildlife, all analytes detected in surface water (with the exception of essential nutrients) are retained as ECPCs. If the maximum detected concentration of an analyte exceeds the groundwater ecological screening value, the analyte is retained as an ECPC for aquatic receptors.

Twenty surface soil samples (16-SL-01 through 16-SL-03 and 16S00101 through 16S01701 with duplicates at 16S00101D and 16S01001D) were collected at Site 16 (see Figure 3-3 or 5-11). Samples 16-SL-01 through 16-SL-03 were collected as part of the Phase IIA investigation in August 1992, and samples 16S00101 through 16S01701 were collected as part of the Phase IIB investigation in December 1995. Surface soil samples were analyzed for VOCs, SVOCs, pesticides and PCBs, and inorganics. A single unfiltered surface water sample, 16W00101, was collected from the ephemeral wetlands. Unfiltered groundwater results were used to evaluate potential ecological risks to Clear Creek. A discussion of which groundwater samples were used to evaluate both human health and ecological risks is provided in Subsection 6.3.

Tables 7-2 and 7-4 present a summary of the respective surface soil, and groundwater analytical data and the following information: frequency of detection, range of reporting limits, range of detected concentrations, average of detected concentrations, background screening concentrations, ecological screening values, 95 percent UCLs, and selected ECPCs. A summary of the surface water data including the frequency of detection, range of reporting limits, range of detected concentrations, and selected ECPCs is presented in Table 7-3.

As shown in Table 7-2, ECPCs selected for the surface soil samples collected at Site 16 include 13 SVOCs (carbazole, bis(2-ethylhexyl)phthalate, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno (1,2,3-cd) pyrene, phenanthrene, and pyrene), 1 PCB (Aroclor-1254), 5 pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aroclor-1254, and dieldrin), and 12 inorganic constituents (aluminum, arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, silver, vanadium, and zinc).

As shown in Table 7-3, ECPCs selected for the surface water sample collected from the ephemeral wetland at Site 16 include two inorganic analytes (aluminum and lead).

As shown in Table 7-4, ECPCs selected for the unfiltered groundwater samples collected at Site 16 include three VOCs (benzene, TCE, and xylenes), one SVOC (-bis(2-ethylhexyl)phthalate), one pesticide (4,4'-DDT), and ten inorganics (aluminum, barium, cobalt, copper, cyanide, iron, lead, manganese, vanadium, and zinc).

7.4 EXPOSURE ASSESSMENT. The purpose of the ecological exposure assessment is to estimate or measure the amount of an ECPC to which an ecological receptor may be exposed. The following sections briefly describe how contaminant exposures are estimated or measured for wildlife, terrestrial plants, and invertebrates at Site 16 and aquatic receptors in Clear Creek downgradient of Site 16. The contaminant pathway model (Figure 7-2) provides a summary of the potential exposure pathways that exist at Site 16 for each group of receptors. Additional details regarding the exposure assessment are provided in the GIR (HLA, 1998).

7.4.1 Calculation of EPCs The EPC is a representative concentration used for evaluating risks throughout this ERA. RME and central tendency (CT) concentrations are derived for each ECPC. Because the sample sizes for both the surface soil and groundwater data sets are greater than ten, the RME value is equal to the lesser of the maximum detected concentration and the 95 percent UCL calculated on the log-transformed arithmetic mean (USEPA, 1992c). One-half of the detection limit is used to calculate the 95 percent UCL. If potential risks are predicted based on the RME scenario, then the CT exposure scenario is also evaluated. The CT exposure concentration is represented by the arithmetic mean of all samples. One-half of the detection limit is also used as a surrogate value for sample results that are below the detection limit. Because only one surface water sample was collected at Site 16, the EPC for surface water ECPCs is equal to the detected concentration for each ECPC.

Tables 7-2, 7-3, and 7-4 present the EPCs for surface soil, surface water, and groundwater ECPCs, respectively.

7.4.2 Terrestrial Wildlife Exposure routes for wildlife receptors include direct ingestion of soil and surface water and indirect ingestion of food containing site-related chemicals. The actual amount of an ECPC taken in by

Table 7-2
Selection of Ecological Chemicals of Potential Concern in Surface Soil Associated with Site 16

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Volatiles Organic Compounds (μg/kg)											
Toluene	1/20	6 to 13	1	1	ND	50	No[12]				
Xylenes (total)	3/20	6 to 13	1 to 5	2.7	ND	50	No[12]				
Semivolatile Organic Compounds (μg/kg)											
Anthracene	1/20	350 to 420	95	95	ND	100	No[11, 12]				
Benzo(a)anthracene	4/20	350 to 420	56 to 2,300	668	ND	[15]100	Yes	351	286	351	286
Benzo(a)pyrene	5/20	350 to 840	71 to 3,100	746	ND	100	Yes	372	328	372	328
Benzo(b)fluoranthene	4/20	350 to 840	86 to 3,600	1,084	ND	[15]100	Yes	412	369	412	369
Benzo(g,h,i)perylene	3/20	350 to 420	120 to 1,200	603	ND	[15]100	Yes	299	251	299	251
Benzo(k)fluoranthene	3/20	350 to 420	73 to 3,200	1,204	ND	[15]100	Yes	388	343	388	343
Carbazole	1/17	350 to 420	97	97	ND	NA	Yes	202	185	97	97
Chrysene	5/20	350 to 420	54 to 3,200	741	ND	[15]100	Yes	388	327	388	327
Dibenzo(a,h)anthracene	2/20	350 to 420	110 to 700	405	ND	[15]100	Yes	240	212	240	212
Fluoranthene	4/20	350 to 420	59 to 2,300	676	ND	100	Yes	344	288	344	288
Indeno(1,2,3-cd)pyrene	4/20	350 to 420	62 to 1,900	573	ND	[15]100	Yes	324	266	324	266
Phenanthrene	2/20	350 to 420	52 to 440	246	ND	100	Yes	233	196	233	196
Pyrene	4/20	350 to 420	44 to 1,700	516	ND	100	Yes	314	256	314	256
bis(2-Ethylhexyl)phthalate	7/20	350 to 420	43 to 116.5*	70.1	80	100	Yes	204	149	117	117

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern in Surface Soil Associated with Site 16

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Pesticides and PCBs (µg/kg)											
4,4'-DDD	2/20	3.6 to 21	2.1 to 18	10.1	ND	2.5	Yes	6.2	4.4	6.2	4.4
4,4'-DDE	9/20	3.6 to 21	2.6* to 100	30.2	ND	2.5	Yes	37	15	37	15
4,4'-DDT	9/20	3.6 to 21	3.25* to 89	20.8	ND	2.5	Yes	19.9	10.8	19.9	10.8
Aroclor-1254	2/20	36 to 210	36 to 130	83	ND	20	Yes	68	46	68	46
Aroclor-1260	1/20	36 to 210	79*	79	ND	20	No[11]				
Dieldrin	8/20	3.6 to 21	2.5 to 130	31	29	0.5	Yes	31.5	14.7	31.5	14.7
alpha-Chlordane	3/20	1.8 to 99	1.6 to 9.4*	4.5	ND	100	No[12]				
gamma-Chlordane	3/20	1.8 to 99	1 to 5.95*	3.1	ND	100	No[12]				
Inorganic Analytes (mg/kg)											
Aluminum	20/20	40 to 40	1,890* to 18,600	8,724	13,500	50	Yes	11,271	8,724	11,271	8,724
Antimony	1/20	2.7 to 12	5.9	5.9	8	3.5	No[13]				
Arsenic	20/20	2	0.7* to 12.1	2.8	[16]4.6	10	Yes	3.8	2.8	3.8	2.8
Barium	20/20	40	4.45* to 257	36.8	18.8	165	Yes	63.4	36.8	63.4	36.8
Beryllium	15/20	1	0.06 to 0.295*	0.12	0.36	1.1	No[12]				
Cadmium	17/20	0.61 to 1	0.21 to 7.6	1.3	0.98	1.6	Yes	2.1	1.2	2.1	1.2
Calcium	20/20	1,000	70.8 to 2,350	584	446	NA	No[14]				
Chromium	20/20	2	3.2 to 29.2	10.6	10	0.4	Yes	15	10.6	15	10.6
Cobalt	11/20	10	0.69 to 4.1	1.7	2.8	20	No[12]				
Copper	19/20	5	2.9 to 202	34.1	8	40	Yes	78.3	32.5	78.3	32.5
Cyanide	8/20	0.24 to 0.5	0.12* to 0.51	0.2	0.28	5.0	No[12]				
Iron	20/20	20	1,390* to 48,900	9,240	7,744	200	No[14]				

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern in Surface Soil Associated with Site 16

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	Ecological Screening Value[5]	Chemical of Ecological Concern[6]	95th % UCL[7]	Average of All Samples[8]	Exposure Point Concentration	
										RME[9]	CT[10]
Inorganic Analytes (mg/kg) (Continued)											
Lead	20/20	0.6 to 1	4.4 to 759	110	10.2	50	Yes	473	110	473	110
Magnesium	20/20	1,000	34.2* to 443	157	244	NA	No[14]				
Manganese	20/20	3	5.25* to 372	129	324	100	Yes	296	129	296	129
Mercury	9/20	0.08 to 0.1	0.05 to 0.65	0.17	0.12	0.1	Yes	0.13	0.1	0.13	0.1
Nickel	11/20	2.4 to 8	2.3 to 26	7.2	6.8	30	No[12]				
Potassium	6/20	133 to 1,000	69.7 to 288.8*	159	177	NA	No[14]				
Selenium	7/20	0.41 to 1	0.15 to 0.345*	0.21	0.46	0.81	No[12, 13]				
Silver	6/20	0.33 to 2	0.87 to 7.1	2.8	0.7	2.0	Yes	2.3	1.4	2.3	1.4
Sodium	18/20	1,000	114 to 361	178	382	NA	No[13, 14]				
Thallium	2/20	0.46 to 2	0.13 to 0.18	0.16	1.16	1.0	No[12, 13]				
Vanadium	20/20	10 to 10	3.3* to 28.9	15.8	19	2.0	Yes	21.1	15.8	21.1	15.8
Zinc	20/20	4 to 4	3.75* to 773	104	15.8	50	Yes	412	104	412	104

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the detection limit is used as a surrogate for concentration for the sample where a nondetection was reported.
[3] The average of detected concentrations is the arithmetic mean of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening value is twice the average of detected concentrations for inorganic analytes in background samples. Background screening values for organic analyte values are one times the average of detected concentrations. Organic values are included for comparison purposes only (i.e., not used to select ecological contaminant of potential concerns).
[5] The ecological screening values are the Region IV Recommended Ecological Screening values for Soil. USEPA Region IV memorandum 4WD-OTS, December 22, 1998.
[6] These chemicals are retained for further evaluation in the ecological risk assessment.
[7] The 95% UCL is calculated on the log-transformed average of all samples using the formula provided in the USEPA *Supplemental Guidance to RAGS: Calculating the Concentration Term* (USEPA, 1992d). The 95% UCL is not calculated when there are less than 10 total samples.
[8] The average of all samples assigns a value of one-half of the detection limit as a surrogate concentration for nondetect values.
[9] The RME concentration is equal to the lesser of the maximum detected concentration or the 95th % UCL.

Notes continued on next page.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern in Surface Soil Associated with Site 16

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[10] The CT exposure point concentration (EPC) is equal to the lesser of the average of all samples or the maximum exposure point concentration.
[11] The analyte was detected in less than 5 percent of the samples and was not detected in any other media.
[12] The maximum detected concentration is less than the ecological screening value.
[13] The maximum detected concentration is less than the background screening concentration.
[14] The analyte is an essential nutrient and not considered toxic.
[15] The ecological screening value of benzo(a)pyrene is used as a surrogate value.
[16] The background screening concentration for arsenic is the average of surface and subsurface soil background concentration. For additional information, see Appendix I in the GIR (HLA, 1998).

Notes: Samples: 16-SL-01, 16-SL-02, 16-SL-03, 16S00101, 16S00201, 16S00301, 16S00401, 16S00501, 16S00601, 16S00701, 16S00801, 16S00901, 16S01001, 16S01101, 16S01201, 16S01301, 16S01401, 16S01501, 16S01601, 16S01701.
Duplicate samples: 16S00101D, 16S01001D.
Background samples: BKG-SL-01, BKG-SL-02, BKG-SL-06, BKG-SL-07, BKG-SL-08, BKG-SL-09, BKG-SL-10, BKS00101, BKS00201, BKS00401, BKS00501.
Background duplicate samples: BKG-SL-09A, BKS00201D.

% = percent.
UCL = upper confidence level.
RME = reasonable maximum exposure.
CT = central tendency.
μg/kg = micrograms per kilogram.
ND = not detected in any background sample.
* = average of a sample and its duplicate.
PCB = polychlorinated biphenyl.
DDD = dichlorodiphenyldichloroethane.
DDT = dichlorodiphenyltrichloroethane.
DDE = dichlorodiphenyldichloroethene.
mg/kg = milligrams per kilogram.
NA = not available.

Table 7-3
Selection of Ecological Chemicals of Potential Concern in Surface Water at Site 16

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Naval Air Station Whiting Field
Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit	Detected Concentration	Background Screening Concentration[2]	Chemical of Ecological Concern
Inorganic Analytes ($\mu g/\ell$)					
Aluminum	1/1	200	758	654	Yes
Barium	1/1	200	28.6	72.6	No[3]
Beryllium	1/1	5	0.21	0.94	No[3]
Calcium	1/1	5,000	8,890	3,320	No[4]
Iron	1/1	100	730	964	No[3]
Lead	1/1	3	5.2	ND	Yes
Magnesium	1/1	5,000	1,170	2,430	No[4]
Manganese	1/1	15	4.4	42.8	No[3]
Potassium	1/1	5,000	2,780	1,530	No[4]
Sodium	1/1	5,000	1,120	4,770	No[4]
Zinc	1/1	20	29.2	200	No[3]

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The background screening concentration is twice the average detected concentration for inorganic analytes in background samples.
[3] The detected concentration is less than the background screening concentration. Therefore, the analyte will not be evaluated further.
[4] Analyte is an essential nutrient and not considered toxic.

Notes: Sample: 16W00101.

$\mu g/\ell$ = micrograms per liter.

Table 7-4
Selection of Ecological Chemicals of Potential Concern in Unfiltered Groundwater at Site 16

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Milton, Florida

Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	USEPA Chronic Screening Values (µg/ℓ)[5]	Chemical of Ecological Concern	95th % UCL[6]	Average of All Samples[7]	Exposure Point Concentration RME[8]	Exposure Point Concentration CT[9]
Volatiles Organic Compounds (µg/ℓ)											
1,2-Dichloroethane	6/17	10 to 50	1 to 32	19	NA	2000	No[10]				
1,2-Dichloroethene (total)	6/17	10 to 50	1 to 50	16.5	NA	303	No[10]				
Benzene	7/17	10 to 50	1 to 820	428	NA	53	Yes	4,188	179	820	179
Chloroform	3/17	10 to 40	1	1	NA	289	No[10]				
Ethylbenzene	2/17	10 to 50	5 to 6	5.5	NA	453	No[10]				
Toluene	2/17	10 to 50	1	1	NA	175	No[10]				
Trichloroethene	5/17	10 to 50	2 to 7	3.8	NA	NSC	Yes	7.1	5.5	7	5.5
Xylenes (total)	1/17	10 to 50	1	1	NA	NSC	Yes	10.3	7.1	1	1
Semivolatile Organic Compounds (µg/ℓ)											
Naphthalene	3/17	10	1	1	NA	62	No[10]				
Phenol	3/17	10	4 to 8	5.7	NA	256	No[10]				
bis(2-Ethylhexyl)phthalate	7/17	10	1 to 53	9.5	NA	0.3	Yes	11.7	6.9	11.7	6.9
Pesticides and PCBs (µg/ℓ)											
4,4-DDT	2/17	0.1	0.14 to 0.15	0.15	NA	0.001	Yes	0.07	0.06	0.07	0.06
Inorganic Analytes (µg/ℓ)											
Aluminum	10/17	14.65 to 200	121 to 3,930	796	654	87	Yes	2,165	491	2,165	491
Antimony	1/17	8.6 to 60	17.4	17.4	20.4	160	No[10,11]				
Arsenic	4/17	0.5 to 10	0.6 to 3.6	1.5	ND	190	No[10]				
Barium	17/17	200	10* to 456	53.9	72.6	NSC	Yes	73	53.9	73	53.9

See notes at end of table.

Table 7-4 (Continued)
Selection of Ecological Chemicals of Potential Concern in Unfiltered Groundwater at Site 16

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Analyte	Frequency of Detection[1]	Reporting Limit Range	Detected Concentration Range[2]	Average of Detected Concentrations[3]	Background Screening Concentration[4]	USEPA Chronic Screening Values ($\mu g/\ell$)[5]	Chemical of Ecological Concern	95th % UCL[6]	Average of All Samples[7]	Exposure Point Concentration	
										RME[8]	CT[9]
Inorganic Analytes ($\mu g/\ell$) (Continued)											
Beryllium	1/17	0.3 to 5	0.42	0.42	0.94	0.53	No[10,11]				
Cadmium	2/17	1.2 to 5	2.2 to 12.5	7.4	4.4	0.66	No[10]				
Calcium	15/17	236.5 to 308	623 to 78,800	16,462	3,320	NSC	No[12]				
Chromium	4/17	2 to 10	2.1 to 4.6	2.9	30	11	No[10,11]				
Cobalt	2/17	1.15 to 50	2.175* to 3	2.6	ND	NSC	Yes	76.7	18.2	3	3
Copper	6/17	1.1 to 25	1.4 to 11.9	4.2	10.8	6.54	Yes	26.8	7.5	11.9	7.5
Cyanide	1/17	1.5 to 5.2	12	12	7	5.2	Yes	2.3	1.8	2.3	1.8
Iron	14/17	41.2 to 100	7.25* to 68,600	5,538	964	1000	Yes	44,802	4,568	44,802	4,568
Lead	4/17	0.5 to 3	0.5 to 5.7	3.1	ND	1.32	Yes	3.2	1.6	3.2	1.6
Magnesium	17/17	NR	268.5* to 8,690	1,841	2,430	NSC	No[12]				
Manganese	17/17	0.5 to 15	1.3* to 1,370	188	42.8	NSC	Yes	1,652	188	1,370	188
Nickel	3/17	7.3 to 40	7.7 to 8.7	8.2	42.8	87.71	No[10,11]				
Potassium	13/17	316 to 5,000	322 to 4,790	1,600	1,530	NSC	No[12]				
Sodium	17/17	NR	1,500* to 20,400	4,466	4,770	NSC	No[12]				
Vanadium	4/17	1.2 to 50	1.3 to 25.2	7.6	3.8	NSC	Yes	124	15.2	25.2	15.2
Zinc	8/17	1.5 to 20	26.7 to 381	138	200	58.91	Yes	572	69.1	381	69.1

[1] Frequency of detection is the number of samples in which the analyte was detected in relation to the total number of samples analyzed (excluding rejected values).
[2] The value indicated by an asterisk is the average of a sample and its duplicate. For duplicate samples having one nondetect value, one-half of the contract required quantification limit/contract required detection limit is used as a surrogate concentration for the sample where nondetect was reported.
[3] The average of detected concentrations is the arithmetic average of all samples in which the analyte was detected. It does not include those samples with "R", "U", or "UJ" validation qualifiers.
[4] The background screening concentration is twice the average of detected concentrations for inorganic analytes in background samples.
[5] The ecological screening values are from USEPA Region IV *Supplemental Guidance to RAGS: Ecological Risk Assessment*, (USEPA, 1995c).

Notes continued on next page.

Table 7-4 (Continued)
Selection of Ecological Chemicals of Potential Concern in Unfiltered Groundwater at Site 16

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[6] The 95% upper confidence limit (UCL) is calculated on the log-transformed average of all samples using the formula provided in the USEPA *Supplemental Guidance to RAGS: Calculating the Concentration Term* (USEPA, 1992d). The 95% UCL is not calculated when there are less than 10 total samples.
[7] The average of all samples assigns a value of one-half of the contract required quantification limit/contract required detection limit as a surrogate concentration for samples where nondetect was reported.
[8] The RME concentration is equal to the lesser of the maximum detected concentration or the 95th % UCL.
[9] The CT concentration is equal to the lesser of the average of all samples or the maximum exposure point concentration.
[10] The maximum detected concentration is less than the ecological screening concentration. Therefore, the analyte will not be evaluated further.
[11] The maximum detected concentration is less than the background screening concentration. Therefore, the analyte will not be evaluated further.
[12] Analyte is an essential nutrient and is not considered toxic. Therefore, the analyte will not be evaluated further.

Notes: Samples: 16G00101, 16G00201, 16G00202, 16G00203, 16G00301, 16G00302, 16G00303, 16G00304, 16G00401, 16G00402, 16G00403, 16G00501, 16G00601, 16G00602, 16G00701, 16G00702, and 16G00703.
Duplicate sample: 16G00501D.
Background samples: BKG00101 through BKG00103, BKG00201 through BKG00203, and BKG00301.
Background duplicate sample: BKG00101D.

USEPA = U.S. Environmental Protection Agency.
$\mu g/\ell$ = micrograms per liter.
% = percent.
UCL = upper confidence level; see footnote 6.
RME = reasonable maximum exposure.
CT = central tendency.
NA = not available.
NSC = no screening concentration available.
PCB = polychlorinated biphenyl.
DDT = dichlorodiphenyltrichloroethane.
* = average of sample and duplicate.
ND = not detected in any background sample.

wildlife species (i.e., ingestion dose in milligrams per kilogram per day [mg/kg-day]) depends on a number of factors. A potential dietary exposure (PDE) model is used to estimate exposure to representative wildlife species. The PDE (or body dose) is calculated for each ECPC in surface soil and surface water using the equations presented in Table 7-5 and the methodologies described in the GIR (HLA, 1998).

Wildlife species from different trophic guilds, which may be present at the site, were selected for the PDE model. The model uses species-specific feeding and habitat characteristics to estimate chemical exposures to wildlife species respective to their position in the food chain. Terrestrial receptors were chosen to represent the trophic levels typically found in the planted pine forest habitat present at Site 16. The representative wildlife species considered in the ERA are summarized in Table 7-6 and discussed below.

- **Cotton mouse** (*Peromyscus gossypinus*). The cotton mouse represents a small mammalian herbivore that could potentially be exposed to contamination in soil and in plant tissue (accumulated from the soil). The cotton mouse home range is estimated at 0.147 acre and could reside entirely on the site. The cotton mouse represents the small mammal herbivore community at Site 16.

- **Short-tailed shrew** (*Blarina brevicauda*). The short-tailed shrew finds suitable habitat in forests, fields, marshes, and brush and has a home range of approximately 1 acre. It primarily feeds on earthworms, snails, centipedes, insects, small vertebrates, and slugs (DeGraaf and Rudis, 1986). Insectivorous species may receive relatively high chemical doses of bioaccumulating compounds as a result of their voracious appetites. The shrew represents small omnivorous mammals that may be found in the pine forest of Site 16. An insectivorous bird was selected as a representative species rather than a graminivorous bird because it represents a worse case scenario, as invertebrates tend to bioaccumulate chemicals more readily than plants. As indicated in Table H-1, the invertebrate bioaccumulation factors are an order of magnitude higher than the plant bioaccumulation factors, for the CPCs in surface soil.

- **Eastern meadowlark** (*Sturnella magna*). The eastern meadowlark is most commonly found in open pastures, prairies, farms, and meadows, and has a home range of approximately 5 acres. The meadowlark feeds primarily on invertebrates, although its diet is supplemented with plants. The meadowlark represents insectivorous avian receptors at Site 16. An insectivorous bird was selected as a representative species rather than a graminivorous bird because it represents a worse case scenario, as invertebrates tend to bioaccumulate chemicals more readily than plants. As indicated in Table H-1, the invertebrate bioaccumulation factors are an order of magnitude higher than the plant bioaccumulation factors, for the CPCs in surface soil.

- **Red Fox** (*Vulpes vulpes*). This omnivorous mammal prefers open woodlands and grassy fields and is most active at night and twilight. It is an opportunistic forager, feeding on small mammals, birds, amphibians, reptiles, invertebrates, berries, and other fruits (Burt and

Table 7-5
Estimation of Potential Chemical
Exposures for Representative Wildlife Species at Site 16

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Estimation of Chemical Exposures Related to Surface Soil

Scope: Estimates the amount (dose) of a chemical ingested and accumulated by a species via incidental ingestion of surface soil and food items containing site-related chemicals.

Soil Chemical Concentration: The lesser of the maximum detected concentration or the 95th percent upper confidence limit (UCL) of the mean is selected as the reasonable maximum exposure concentration.

Soil Exposure Concentration:

$$\underset{(mg/kg)}{\text{Soil Exposure}} = \left(\text{\% of Diet as Soil} \times \underset{(mg/kg)}{\text{Soil Concentration}}\right)$$

Primary Prey Item Concentration (T_{N1})

$$\underset{(mg/kg)}{\text{Primary Prey Item Concentration}} = \left(BAF_{inv\ or\ plant} \times \underset{(mg/kg)}{\text{Soil Concentration}}\right)$$

Secondary Prey Item Concentration (T_{N2}):

$$\underset{(mg/kg)}{\text{Secondary Prey Item Concentration}} = \left(BAF_{mam\ or\ bird} \times \underset{(mg/kg)}{\text{Tissue Concentration of Primary Prey Items}^{*}}\right)$$

where BAF = Bioaccumulation Factor or mg/kg fresh weight tissue over mg/kg dry weight soil for invertebrates and plants, and mg/kg fresh weight tissue over mg/kg fresh weight food for small mammals and small birds.

* For a discussion of the weighted chemical concentration in prey items, see explanation of the PDE term below, and the GIR (HLA, 1998).

Total Exposure Related to Surface Soil:

$$\underset{(mg/kgBW\text{-}day)}{PDE} = \frac{[P_1 \times T_1 + \ldots + P_N \times T_N + \text{soil exposure}] \times IR_{Diet} \times SFF \times ED}{BW}$$

where
- PDE = potential dietary exposure (mg/kg BW-day),
- P_N = percent of diet composed of food item N,
- T_N = tissue concentration in food item N (mg/kg),
- IR_{Diet} = food ingestion rate of receptor (kg of food or dietary item per day),
- BW = body weight (kg) of receptor,
- SFF = site foraging frequency (site area [acres] divided by home range [acres]) (SFF cannot be greater than1), and
- ED = exposure duration (fraction of year species is expected to occur onsite

See notes at end of table.

Table 7-5 (Continued)
Estimation of Potential Chemical Exposures for Representative Wildlife Species at Site 16

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Estimation of Chemical Exposures Related to Surface Water

Description:	Estimates the amount of a chemical ingested and accumulated by a species resulting from incidental ingestion of surface water.
Chemical Concentration:	Same procedure as described above for soil .
Surface Water Exposure:	$$\underset{(mg/day)}{\text{Surface Water Exposure}} = \left(\underset{(\ell/day)}{IR_{sw}} \times \underset{(mg/\ell)}{\text{Surface Water Concentration}} \right)$$ Where IR_{sw} = water ingestion rate of receptors (liters of water per day)

Notes: mg/kg = milligrams per kilogram.
% = percent.
BAF = bioaccumulation factor.
inv = invertebrate species.
mam = mammal species.
BW-day = body weight per day.
kg = kilograms.
mg/day = milligrams per day.
ℓ/day = liters per day.
mg/ℓ = milligrams per liter.

Grossenheider, 1976). The red fox has an estimated home range of approximately 250 acres and represents the large predatory mammal guild at Site 16.

- **Great-horned owl** (*Bubo virginianus*). The great-horned owl is primarily a nocturnal hunter of small mammals. Its habitat includes deep woods and heavily wooded swamps often near open country where it may hunt for primary prey items consisting of small mammals and birds (DeGraaf and Rudis, 1986). The great-horned owl home range is approximately 15 acres. The owl represents the predatory avian carnivores of forested areas of Site 16.

Table 7-6
Ecological Receptors Evaluated For Site 16

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Receptor Evaluated		Method of Evaluation
Common Name	Scientific Name	
Terrestrial Plants	Lettuce seed (*Lactuca sativa*)	Toxicity testing using lettuce seed germination
Terrestrial Invertebrates	Earthworm (*Eisenia foetida*)	Toxicity testing using survival and growth of earthworms
Cotton mouse	*Peromyscus gossypinus*	Food-web model
Short-tailed shrew	*Blarina brevicauda*	Food-web model
Eastern meadowlark	*Sturnella magna*	Food-web model
Red fox	*Vulpes vulpes*	Food-web model
Great-horned owl	*Bubo virginianus*	Food-web model

Parameters for quantitatively evaluating exposures to wildlife include body weight, food ingestion rate, home range, and relative consumption of food items. Exposure assumptions for each of the representative wildlife species for Site 16 are provided in Table 7-7 and Tables H-7 and H-11 of Appendix H. In addition to these parameters, the species foraging habits and bioaccumulation in food items are also considered.

The site foraging frequency (SFF) is an adjustment term that accounts for the frequency a receptor feeds within the site area. The SFF is based on both the acreage of the site relative to the receptor's home range and the fraction of the year the receptor would be exposed to site-related chemicals (i.e., the exposure duration). By definition, the SFF cannot exceed 1. The area of Site 16 (approximately 12 acres) is larger than the home range for the cotton mouse, short-tailed shrew, and eastern meadowlark and smaller than the home range for the red fox and the great-horned owl. Because all representative wildlife species are expected to actively forage at the site year-round, it is assumed that the exposure durations for these organisms are 1.

Wildlife species may be exposed to ECPCs in surface soil via incidental ingestion of soil or by ingesting prey items that have bioaccumulated these ECPCs. To estimate this exposure, a PDE is estimated for all representative wildlife

Table 7-7
Exposure Parameters for Representative Wildlife Species

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Representative Wildlife Species	Body Weight (kg)	Reported Diet	Assumed Diet for Terrestrial Exposure Assessment (% of diet)	Food Ingestion Rate (kg/day)	Water Ingestion Rate (ℓ/day)	Home Range (acres)
Cotton mouse [a] (*Peromyscus gossypinus*)	0.021 [b]	Seeds and some insects. [c]	88% Plants 10% Invertebrates 2% Soil [d]	0.0029 [e]	0.003 [f]	0.147 [g]
Eastern meadowlark (*Sturnella magna*)	0.087 [i]	Insects, weed seeds and grass seeds, 75% of diet is invertebrates (beetles, grubs, bugs, grasshoppers, crickets, ants, and spiders). [i]	75% Invertebrates 20% Plants 5% Soil [i]	0.0119 [l]	0.0115 [k]	5 [i]
Short-tailed shrew (*Blarina brevicauda*)	0.017 [h]	Earthworms, slugs and snails, fungi, insects, and vegetation. [c]	78% Invertebrates 12% Plants 10% Soil [c]	0.0024 [e]	0.0025 [f]	0.96 ± 0.09 [c]
Great-horned owl (*Bubo virginianus*)	1.50 [i]	Mostly rabbits, mice, rats, squirrels, birds. bats, snakes, frog, crayfish and grasshoppers. [i]	80% Small mammals 19% Birds 1% Soil [c]	0.078 [l]	0.077 [k]	15 [m]
Red fox (*Vulpes vulpes*)	4.69 [c]	Small mammals, birds, and invertebrates, as well as berries and other fruits. [c]	57% Small mammals 20% Invertebrates 10% Small birds 10% Plants 3% Soil [c]	0.24 [e]	0.398 [f]	250 [c]

See notes at end of table.

Table 7-7 (Continued)
Exposure Parameters for Representative Wildlife Species

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References:
[a] Values for the deer mouse were used for the cotton mouse (U.S. Environmental Protection Agency [USEPA], 1993b).
[b] Average of adult male and female deer mice in North America (USEPA, 1993b).
[c] Wildlife Exposure Factors Handbook (USEPA, 1993b).

- Invertebrate, plant, and soil values for the short-tailed shrew derived from data presented in Whitaker & Ferraro, 1963.
- Invertebrate, plant, small mammal, small bird and soil values for red fox are averages of values presented in Wildlife Exposure Factors Handbook.
- Small mammal, small bird, and soil values for the owl are averages of the values presented in Wildlife Exposure Factors Handbook.

[d] Deer mouse value used for cotton mouse based on similarities in diet. Plant, invertebrate, and soil values are averages of values presented in the Wildlife Exposure Factors Handbook (USEPA 1993b).
[e] Calculated using the mammal equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0687 \times Wt^{0.822}$ (kg) (USEPA, 1993b).
[f] Water ingestion rate for mammals is based on body weight in kg: water ingestion (l/day) = $0.099 \times Wt^{0.9}$ (kg) (USEPA, 1993b).
[g] Average for male and female deer mice living in a mixed deciduous forest of Virginia (USEPA, 1993b).
[h] Mean of means reported for male and female shrews in summer and fall (USEPA, 1993b).
[i] Terres (1980).
[j] DeGraaf & Rudis (1986).
[k] Water ingestion rate for birds is based on body weight in kg: water ingestion (l/day) = $0.059 \times Wt^{0.67}$ (kg) (USEPA, 1993b).
[l] Calculated using the bird equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0582 \times Wt^{0.651}$ (kg) (USEPA, 1993b).
[m] Great-horned owl home range taken from low end of range in SE Madison County, N.Y. (Hager, 1957).

Notes: kg = kilograms.
kg/day = kilograms per day.
ℓ/day = liters per day.
% = percent.
± = plus or minus.

species for each ECPC according to the equations in Table 7-5 and the methodologies described in Subsection 2.4.3 of the GIR (HLA, 1998).

Bioaccumulation factors (BAFs) are used in the wildlife exposure model to estimate the transfer of chemicals in soil to plants or soil invertebrates, and between these organisms and primary consumer species. To estimate the PDE, tissue concentrations of ECPCs in prey items are estimated using BAFs for surface soil. BAFs for most receptors are extrapolated from literature values or estimated using regression equations from scientific liter-literature. Based on the evidence provided in several reference materials (Suter, 1993; Maughan, 1993), an assumption is made that VOCs do not bioaccumulate in prey tissue. The general approach used to select BAFs for Site 16 is summarized in Table 7-8.

BAFs for invertebrate and plant food items are defined as the ratio of the ECPC concentration in plant or invertebrate tissue (mg chemical/kg tissue wet-weight) to the ECPC concentration in surface soil (mg chemical/kg dry-weight soil). BAFs reported in the scientific literature for avian and mammalian receptors are the reported ratios of ECPC concentrations in the tissues of these receptors (mg chemical/kg tissue wet-weight) to the concentrations of ECPCs in their food items (mg chemical/kg tissue wet-weight). BAFs for each of the ECPCs evaluated at Site 16 are included in Table H-1 of Appendix H.

<u>7.4.3 Terrestrial Plants and Invertebrates</u> Terrestrial plants and invertebrates may be exposed to ECPCs via direct contact with and root uptake (plants) or ingestion (invertebrates) of ECPCs measured in Site 16 surface soil and surface water. For the purposes of the quantitative evaluation of soils at Site 16, the primary exposures to terrestrial plants and invertebrates are assumed to occur within the top one-foot interval of surface soil and these data were qualitatively evaluated. Exposure of terrestrial plants and invertebrates is qualitatively evaluated for exposure to subsurface soil as deep rooted and deep burrowing invertebrates may be exposed to this medium. Exposure of terrestrial plants to groundwater is not evaluated because the depth to the water table is approximately 10 to 15 feet bls (see hydrogeological discussion in Section 5.2 of this report).

<u>7.4.4 Aquatic Receptors</u> Exposure concentrations for aquatic receptors in Clear Creek are equal to the RME concentrations of ECPCs detected in groundwater. The focus of the groundwater evaluation is to screen the contaminants detected in groundwater at Site 16, not to estimate actual exposures. The screening evaluation will be used to identify the analytes, detected at concentrations that could potentially pose a risk to aquatic receptors. The results of this screen will be used to identify potentially significant migration pathways to Clear Creek.

<u>7.5 ECOLOGICAL EFFECTS ASSESSMENT</u>. The ecological effects assessment discusses what measurement endpoints were used to evaluate potential adverse impacts to the assessment endpoints (i.e., the maintenance of receptor populations). The methods used for identifying and characterizing ecological effects for ECPCs in surface soil, surface water, and groundwater are described in the following subsections and in greater detail in Subsection 2.4.4 of the GIR (HLA, 1998).

Wildlife receptors, terrestrial plants, and terrestrial invertebrates are potentially exposed to ECPCs in surface soil; terrestrial wildlife is exposed to

Table 7-8
Estimation of Bioaccumulation Factors for Site 16

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Receptor Group	Nature of Approach	General Approach
Terrestrial Plants		
Unit: mg/kg wet tissue per mg/kg dry soil	Literature Values	When available, literature values were used to estimate plant BAFs.
	SAR	When literature values were not available, plant BAFs for semivolatile organic compounds (SVOCs) were calculated using a regression equation based on the relationship between plant bioconcentration factors and the *n*-octanol-water partition coefficient for soil (K_{ow}s) of analytes (Travis and Arms, 1988).[1] The study found that bioconcentration factors for vegetation are inversely proportional to the square root of the K_{ow}s of an analyte.
	Extrapolation and Empirical Data	When literature values were not available, plant BAFs for inorganic compounds were obtained from Baes et al. (1984).[1]
	Assumption	Although evidence suggests that plants may transport organic analytes with log K_{ow}s <5 (i.e., volatile organic compounds [VOCs]) from the roots into leafy portions (Briggs et al., 1982; Briggs et al., 1983), bioaccumulation data for VOCs is generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s <3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that transfer of VOCs from plant tissue to animal tissue does not occur.
Terrestrial Invertebrates		
Unit : mg/kg wet tissue per mg/kg dry soil	Literature Values	When no site-specific values were available, literature values were used to estimate BAFs for invertebrates.
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s <3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that soil invertebrates do not bioaccumulate VOCs.
Small Mammals		
Unit : mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small mammals.
	SAR	When literature values were not available for SVOCs, BAFs for small mammals were estimated using a regression equation based on the uptake of organic chemicals into beef tissue from Travis and Arms (1988)[3].
	Extrapolation and Empirical Data	When literature values were not available, BAFs for small mammals for inorganics were derived from ingestion-to-beef biotransfer factors (BTFs) presented in Baes et al. (1984)[2].
	Assumption	Bioaccumulation data for VOCs are generally lacking in the scientific literature. In addition, evidence in the literature (Suter, 1993; Maughan, 1993) suggests that analytes with log K_{ow}s < 3.5 are not bioaccumulated into animal tissue. Therefore, it was assumed that small mammals do not bioaccumulate VOCs.

See notes at end of table.

Table 7-8 (Continued)
Estimation of Bioaccumulation Factors For Site 16

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Receptor Group	Nature of Approach	General Approach
Small Birds Unit: mg/kg wet tissue per mg/kg wet food	Literature Values	When available, literature values were used to estimate BAFs for small birds.
	No Information	BAFs were not obtained for SVOCs or for inorganic compounds as there is little bioaccumulation data available for birds. It was assumed that small birds do not accumulate VOCs.

[1] BAFs derived from Baes et al. (1984). Values are based on analysis of literature references, correlations with other chemical and physical parameters, or comparisons of observed and predicted elemental concentrations in vegetative and reproductive plant material and soil. Data are based on dry weight and were converted to a fresh weight basis assuming that plants are 80 percent water. This is generally consistent with the water content of berries (82 to 87 percent water) and leafy vegetables (87 to 95 percent water), presented in Suter (1993). Grains contain a much lower percentage of water (approximately 10 percent); therefore, this assumption likely underestimates exposure to graminivores.

[2] BTFs were converted to a BAF (mg/kg tissue divided by mg/kg food) by multiplying by a food ingestion rate of 12 kg (dry weight) per day (average intake for lactating and nonlactating cattle reported in Travis and Arms, 1988).

Notes: mg/kg = milligrams per kilogram.
BAFs = bioaccumulation factors.
Log K_{ow} = Logarithmic expression of the octanol-water partition coefficient.
< = less than.
kg = kilogram.

ECPCs in the surface water at Site 16; and aquatic receptors are potentially exposed to ECPCs in groundwater that discharge to the surface water of Clear Creek. The measures of adverse ecological effects for these receptors are discussed separately.

<u>7.5.1 Terrestrial Wildlife</u> As identified in the problem formulation, the assessment endpoint selected for terrestrial wildlife is the survival and maintenance of wildlife populations and communities present within the planted pine forest area of Site 16. Because no long-term wildlife population data are available at NAS Whiting Field, a direct measurement of this assessment endpoint is not possible. The literature-derived results of laboratory toxicity studies that relate the dose of a chemical in an oral exposure with an adverse response to growth, reproduction, or survival of a test population (avian or mammalian species) are used as a measure of the assessment endpoint. Wildlife ingestion toxicity data found in the literature are presented in Appendix H, Table H-2 of this report.

Reference toxicity values (RTVs) are derived for each ECPC and representative wildlife species according to the data hierarchy presented in *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final* (USEPA, 1997b). The RTV represents the highest exposure level (e.g., concentration in the diet) not shown to produce adverse effects (e.g., reduced growth, impaired reproduction, increased mortality). For each ECPC, two RTVs representing lethal and sublethal effects are selected for each representative wildlife species. Lethal effects are those that result in mortality while sublethal effects include those that impair or prevent reproduction or growth. The RTVs are assumed to be a measure of the assessment endpoints for the protection of the survival, growth, and reproduction of terrestrial wildlife populations. Lethal RTVs are developed using the following data hierarchy discussed in items 1, 2, and 3 (below), while sublethal RTVs are derived using the methodology discussed in items 1 and 2:

1. For contaminants with well-documented adverse effects, the highest reported exposure level not resulting in significant adverse effects (i.e., a no observed adverse effect level (NOAEL)) was selected as the RTV.

2. Generally, one-tenth of the lowest observed adverse effect level (LOAEL) was selected as the RTV for analytes lacking NOAEL values. However, application of the 10-fold uncertainty factor was based on consideration of the exposure duration, type of toxicity test, and the relationship between the selected measurement and assessment endpoints.

3. The lowest reported oral LD_{50} (oral dose [in mg/kg body weight-day] lethal to 50 percent of a test population) was used to derive the lethal RTV if NOAEL or LOAEL values (based on lethal effects) were not available. The lethal RTV is one-fifth of the lowest reported LD_{50} value for the species most closely related to the representative wildlife receptor. One-fifth of an oral LD_{50} value is considered to be protective against lethal effects for 99.9 percent of individuals in a test population (USEPA, 1986). An assumption is made that the value represented by one-fifth of an oral LD_{50} would be protective of 99.9 percent of the individuals within the terrestrial wildlife populations and represents a level of acceptable risk.

A summary of lethal and sublethal RTVs selected from the ingestion toxicity data is provided in Table H-3 of Appendix H.

If neither lethal nor sublethal toxicity information were available for a taxonomic group, no RTVs were identified and risks associated with the respective ECPC were not quantitatively evaluated. However, the absence of specific data for a taxonomic group does not imply that there is no toxicological effect associated with contaminant exposure by these receptors; therefore, potential risks to these taxonomic groups are qualitatively discussed in the Uncertainties Section (Section 7.7).

<u>7.5.2 Terrestrial Plants and Invertebrates</u> The assessment endpoints selected for terrestrial plants and soil invertebrates at Site 16 are survival and growth of these communities. The toxicity of surface soil at Site 16 was measured using two laboratory toxicity tests: a 14-day survival and a 30-day growth test with earthworms (*E. foetida*) and a 120-hour lettuce seed (*L. sativa*) germination test.

Surface soil samples for toxicity testing were collected from six locations at Site 16 (16N00201, 16N00301, 16N00601, 16N00801, 16N01201, and 16N01301 and a duplicate 16N00301D) and two reference soil samples from uncontaminated sites at NAS Whiting Field (BKN00101 and BKN00301 and its duplicate BKN00301D). The Site 16 and reference soil samples were collected concurrently with surface soil samples (16S00201, 16S00301, 16S00601, 16S00801, 16S01201, 16S01301, BKNS00101 and BKNS00301, respectively) for chemical analyses and represent split samples. The results of the chemical analyses can, therefore, be used to establish contaminant exposure concentrations and provide the means to interpret responses in the bioassays. If adverse effects were observed in either of the bioassays, simple linear regressions were completed to determine if a correlation(s) exists between the concentration of an analyte and the adverse response measured in the bioassay.

Appendix F of the GIR (HLA, 1998) presents the results of the toxicity testing of Site 16 surface soil with *E. foetida* and *L. sativa*. A summary of the results from the earthworm survival and growth and lettuce seed germination test performed on Site 16 surface soil is presented in Table 7-9. A summary of toxicity data for plant receptors and terrestrial invertebrates is presented in Appendix H, Summary of Toxicity Data, Table H-4 and H-5.

Because the earthworm survival and lettuce seed germination data in the reference sample, BKN00101, were significantly different ($P \geq 0.05$) than the reference location, BKN00301, and data from sample BKN00301 were not significantly different from the laboratory control, toxicity data from BKN00101 were not included in the statistical comparison of site-related data and control/reference data. Site-related toxicity data were evaluated by a statistical comparison of mean survival, growth (as wet weight), or germination with the reference sample (BKN00301 and BKN00301D) and the laboratory control.

In the six surface soil samples collected from Site 16, survival of *E. foetida* after 14 and 30 days was 100 percent. Growth rates of *E. foetida* in the six surface soil samples from Site 16 were not significantly ($P \geq 0.05$) different from the laboratory control or the reference sample (BKN00301), indicating that the surface soil from Site 16 is not acutely or chronically toxic to invertebrates.

Table 7-9
Summary of Results from Biological Toxicity Testing[1]

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Sample Identification	*Eisenia foetida* Percent Survival After 14 days (30 days)	*Eisenia foetida* Percent Growth After 30 days	*Lactuca sativa* Percent Germination After 120 Hours
16N00201	100(100)	27.6	96
16N00301	100(100)	8.3	91
16N00301D	100(100)	-4.8	89
16N00601	100(100)	12.3	94
16N00801	100(100)	-1.6	97
16N01201	100(100)	2.3	56*
16N01301	100(100)	9.4	92
Lab. Control	100(100)	13	91
BKN00301	100(100)	10.9	97
BKN00301D	100(100)	5	90
BKN00101	100(63)	29.1	43*

[1] The complete biological testing report is presented in Appendix F of General Information Report (Harding Lawson Associates, 1998).

Note: * = Significantly different (probability less than or equal to 0.05)from the laboratory control.

Soil collected from one of the six Site 16 sampling locations inhibited germination of the lettuce seed. Germination potential of lettuce seed, *L. sativa*, in the laboratory control and reference sample (BKN00301) was significantly different (P≥0.05) from surface soil collected from location 16N01201. Germination in the reference samples was 97 and 90 percent (for samples BKN00301 and BKN00301D, respectively) as compared to 56 percent in sample 16N01201.

7.5.3 Aquatic Receptors. Potential adverse effects associated with Site 16 groundwater ECPCs are available in the form of laboratory aquatic toxicity testing results for individual ECPCs. Aquatic toxicity information for the ECPCs was obtained from searches of the USEPA AQUIRE database (USEPA, 1994d). Information on the AQUIRE database is included in Appendix I. The State of Florida Surface Water Quality Standards (Florida Legislature, 1996) and USEPA Ambient Water Quality Criteria (AWQC); (USEPA, 1988b and 1991c) were also used to assess the potential for adverse effects to aquatic receptors.

7.6 RISK CHARACTERIZATION. This section presents the risk characterization for ecological receptors exposed to affected surface soil, surface water, and groundwater at Site 16. Potential risks associated with exposures to ECPCs in surface soil at Site 16 are discussed separately for wildlife, terrestrial plants, and soil invertebrates. Risks associated with terrestrial wildlife ingestion of surface water ECPCs and aquatic receptor exposures to groundwater ECPCs are also characterized.

Risks to wildlife are characterized by comparing the PDE concentrations for each surface soil and surface water ECPC with its respective RTV (estimated threshold dose for toxicity). Risks to terrestrial plants and soil invertebrates are evaluated based on the results of the respective soil toxicity tests. Risks for aquatic receptors in Clear Creek are evaluated by comparing aquatic toxicity benchmarks to groundwater RME concentrations following application of a 10-fold attenuation factor.

7.6.1 Terrestrial Wildlife Risks for the representative wildlife species associated with ingestion and bioaccumulation of ECPCs in surface soil and prey items were quantitatively evaluated using HQs. HQs are calculated for each ECPC by dividing the PDE concentration by the selected lethal and sublethal RTV. HIs were determined for each receptor by summing the HQs for all ECPCs. When the estimated PDE is less than the RTV (i.e., the HQ < 1), it is assumed that chemical exposures are not associated with adverse effects to receptors and risks to wildlife populations are unlikely to be significant. For instance, if the PDE calculated using the RME concentration is less than the lethal RTV, then it is assumed that adverse effects to the survival of wildlife populations are unlikely to occur. Similarly, if the reasonable maximum PDE is less than the sublethal RTV, then it is assumed that adverse effects to wildlife populations related to growth and reproduction are unlikely to occur. When an HI is greater than 1, a discussion of the ecological significance of the HQs comprising the HI is completed and risks from exposure to CT concentrations of ECPCs are evaluated.

This hazard ranking scheme evaluates potential ecological effects to individual organisms and does not evaluate potential populationwide effects. Contaminants may cause population reductions by affecting birth and mortality rates, immigration, and emigration (USEPA, 1989d). In many circumstances, lethal or sublethal effects may occur to individual organisms with little population-or community-level impacts; however, as the number of individual organisms experiencing toxic effects increases, the probability that population effects will occur also increases. The number of affected individuals in a population presumably increases with increasing HQ or HI values; therefore, the likelihood of population-level effects occurring is generally expected to increase with higher HQ or HI values.

The HQs and HIs based on lethal and sublethal RTVs were calculated for each ECPC and each representative wildlife species. Tables H-8, H-9, H-12, and H-13 of Appendix H present the HQ and HI calculations. A summary of risks to representative wildlife receptors from surface soil ECPCs is provided in Table 7-10. The HIs based on lethal and sublethal RTVs were calculated for each surface water ECPC and each representative wildlife species. Table 7-11 presents the HI calculations.

Lethal effect HIs for representative wildlife species exposed to RME and central tendency concentrations of ECPCs were less than 1; therefore population-level risks are not predicted for these receptors (i.e., bioaccumulating chemicals are not present at sufficiently high enough concentrations to reduce survivability in terrestrial wildlife populations at Site 16).

With the exception of the cotton mouse, sublethal effect HIs for representative wildlife species exposed to RME and CT concentrations of ECPCs were less than 1. Sublethal HIs based on exposure to RME and central tendency concentrations for the white-footed mouse are 5.3 and 2.5 respectively. The primary risk drivers, based on RME concentrations are cadmium and zinc. The primary risk driver, based on central tendency concentrations is cadmium. Based on the results of the food-web model, reductions in the growth and reproduction of small herbivorous mammals are possible at Site 16, but unlikely due to the relatively low HI s (i.e., HI s less than 10).

Summary HIs for representative wildlife species exposed to RME concentrations of surface water ECPCs for lethal and sublethal effects were less than 1; therefore risks are not predicted for these receptors (i.e., ingestion of surface water from the ephemeral wetland at Site 16 is not likely to reduce survivability, growth, and reproduction in terrestrial wildlife populations at Site 16).

7.6.2 Terrestrial Plants Risks for terrestrial plants at Site 16 were evaluated based on the results of soil toxicity tests using lettuce seeds. With the exception of sample 16N01201, germination of the lettuce seed was not inhibited as compared to the reference sample, BKN00301, and the laboratory control. Appendix H presents a series of simple linear regression analyses that evaluate the statistical relationship between biological effects observed in the surface soil bioassays and concentrations of selected analytes in Site 16 surface soil. Although germination of lettuce seeds was slightly inhibited at one of the Site 16 surface soil sampling location, no correlation between germination inhibition and ECPC concentrations was observed (Appendix H). It is possible that reduced germination observed at 16S01201 was either the result of synergistic effects of multiple contaminants or not related to site contamination. Nonmeasured physical, biological, or chemical factors may be responsible for the observed slight reduction in lettuce seed germination (i.e., ECPC exposure concentrations are likely not responsible for the observed effect).

Table 7-10
Summary of Hazard Indices for Terrestrial Wildlife Associated with Exposure to Site 16 Surface Soil[1]

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Ecological Receptors	Lethal Effects from Exposure to Reasonable Maximum EPCs	Lethal Effects from Exposure to Central Tendency EPCs	Sublethal Effects from Exposure to Reasonable Maximum EPCs	Sublethal Effects from Exposure to Central Tendency EPCs
Cotton mouse	0.41	0.21	5.3	2.5
Eastern meadowlark	0.0033	0.0014	0.13	0.069
Short-tailed shrew	0.12	0.061	0.94	0.38
Red fox	0.000078	0.0028	0.0012	0.041
Great-horned owl	0.000044	0.00002	0.014	0.0078

[1] Hazard indices are presented in Tables H-8, H-9, H-12, and H-13.

Note: EPC = exposure point concentration.

Table 7-11
Risks for Representative Wildlife Species from Surface Water ECPCs

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Receptor [a]	Exposure Point Concentration (mg/ℓ) [b]	Water Ingestion Rate (ℓ/day) [a]	Body Weight (kg) [a]	Body Dose [c]	RTVs [d]		HI [e]	
					Lethal	Sublethal	Lethal	Sublethal
				(mg/kgBW-day)				
Aluminum								
Cotton mouse	0.758	0.003	0.021	1.1E-01	7.4E+02	4.3E+02	1.5E-04	2.5E-04
Short-tailed shrew	0.758	0.0025	0.017	1.1E-01	7.4E+02	4.3E+02	1.5E-04	2.6E-04
Eastern meadowlark	0.758	0.0115	0.087	1.0E-01	NA	NA	NC	NC
Red fox	0.758	0.398	4.69	6.4E-02	7.4E+02	4.3E+02	8.7E-05	1.5E-04
Great-horned Owl	0.758	0.077	1.5	3.9E-02	NA	NA	NC	NC
Lead								
Cotton mouse	0.0052	0.003	0.021	7.4E-04	6.0E+01	3.0E+01	1.2E-05	2.5E-05
Short-tailed shrew	0.0052	0.0025	0.017	7.6E-04	6.0E+01	3.0E+01	1.3E-05	2.5E-05
Eastern meadowlark	0.0052	0.0115	0.087	6.9E-04	7.5E+01	4.6E+00	9.2E-06	1.5E-04
Red fox	0.0052	0.398	4.69	4.4E-04	6.0E+01	3.0E+01	7.4E-06	1.5E-05
Great-horned Owl	0.0052	0.077	1.5	2.7E-04	7.5E+01	4.6E+00	3.6E-06	5.8E-05

[a] Exposure parameters including receptors, water ingestion rate, and body weight are presented in Table 7-7.
[b] The surface water exposure point concentrations (EPCs) for aluminum and lead are presented in Table 7-3.
[c] The total body dose is calculated by multiplying the EPC by the water ingestion rate and dividing by body weight.
[d] The RTVs for aluminum and lead are present in Appendix H, Table H-3.
[e] The lethal and sublethal Hazard Indices are calculated by dividing the body dose by the RTV.

Note: NA = not available.

7.6.3 Terrestrial Invertebrates Risks for soil invertebrates at Site 16 were evaluated based on the results of soil toxicity tests using earthworms. After 30 days of exposure to Site 16 surface soil, survival of earthworms in the toxicity test was 100 percent, and percent change in growth was similar (($P \geq 0.05$) to laboratory control and reference sample (BKN00301). The results of the toxicity testing show that surface soil samples collected from Site 16 are not expected to impact the survival and growth of terrestrial invertebrate communities.

7.6.4 Aquatic Receptors The risks associated with ECPCs in groundwater discharged to Clear Creek were evaluated based on comparison of the EPCs in groundwater to reported laboratory toxicity test data (AQUIRE information, USEPA 1994d), Federal AWQC (USEPA, 1988b and 1991c), and State of Florida Surface Water Quality Standards for Class III waters (Florida Legislature, 1996). As previously discussed, EPCs for groundwater are equal to the reasonable maximum exposure point concentrations presented in Table 7-4. Comparison of groundwater EPCs to benchmark values are presented in Table 7-12.

The organic ECPCs in unfiltered groundwater that exceed available screening values include benzene, bis(2-ethylhexyl)phthalate, and 4,4'-DDT. The inorganic ECPCs in unfiltered groundwater that exceed available screening values included aluminum, copper, iron, lead, manganese, and zinc. The results of this screening indicate that there are several analytes detected in groundwater that may pose a potential risk to aquatic receptors. However, further evaluation of the potential and actual risks to aquatic receptors associated with contaminant exposures to Site 16 groundwater will be provided in the ERA for Clear Creek (Site 39).

7.7 UNCERTAINTY ANALYSIS. The objective of the uncertainty analysis is to discuss the assumptions of the ERA process that may influence the risk assessment results and conclusions. Table 2-5 of the GIR presents several general uncertainties inherent in the risk assessment process. (HLA, 1998)

Specific uncertainties associated with exposure to surface soil, surface water, and groundwater at Site 16 include the following:

- Risks to avian species may have been underestimated because bio-accumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with several ECPCs were not evaluated for avian species. If the toxicological and contaminant transport data obtained from studies conducted on mammals were used to estimate risks to avian species, then risk estimates for birds would be higher. However, there is also uncertainty in assuming that the metabolic functions of mammals and birds are similar enough to use inter-taxonomic surrogates.

- The risks to terrestrial wildlife may have been underestimated because the dermal absorption and inhalation pathways were not quantitatively evaluated. Inhalation risks to avian and mammalian species would not likely occur at this site, as this pathway become significant only when there has been an acute exposures (i.e., following a spill or release). Risks to juvenile burrowing/subterranean dwellers may exist as they are in a sensitive lifestage, however fur, feathers, or a chitinous

Table 7-12
Comparison of Site 16 Groundwater ECPC Exposure Concentrations to Toxicity Benchmark Values

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Analyte	RME Exposure Point Concentration (µg/ℓ)[1]	FDEP Class III Fresh Water Quality Standards (µg/ℓ)[2]	AWQC (µg/ℓ)[3]	AQUIRE Lowest Reported Adverse Effect Concentration (µg/ℓ)/Test Species[4]	Result
Volatile Organic Compounds					
Benzene	820	71.28	5,300	3,660/leopard frog LC_{50}	
Trichloroethene	7	[6]80.7	21,900	1,900/medaka LC_{50}	
Xylenes (total)	1	NA	NA	350/scud LC_{50}	
Semivolatile Organic Compounds					
bis(2-Ethylhexyl)phthalate	11.7	3	160	0.89/moorfrog hatchability	Exceeds TBV
Pesticides and PCBs					
4,4'-DDT	0.07	0.001	0.001	0.04/water flea mortality	Exceeds TBV
Inorganic Compounds					
Aluminum	2,165	NA	NA	15/brown trout	Exceeds TBV
Barium	73	NA	NA	68,000/Water flea LC_{50}	
Cobalt	3	NA	NA	[7]11/pikeperch mortality	
Copper	11.9	[8]3.6	[8]3.6	1.5/Water flea reproductive effects	Exceeds TBV
Cyanide	2.3	5.2	5.2	432/Water flea LC_{50}	
Iron	44,802	1,000	1,000	460/brown trout hatchability	Exceeds TBV
Lead	3.2	[8]0.5	[8]0.5	52/rainbow trout mortality	Exceeds TBV
Manganese	1,370	NA	NA	280/phytoplanton species diversity	Exceeds TBV
Vanadium	25.2	NA	NA	128/guppy LC_{50}	
Zinc	381	[8]86	[8]86	17/invertebrate species diversity	Exceeds TBV

See notes at end of table.

Table 7-12 (Continued)
Comparison of Site 16 Groundwater ECPC Exposure Concentrations to Toxicity Benchmark Values

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[1] The exposure point concentration is equal to the RME concentration from Table 7-4.
[2] Chapter 62-302, Surface Water Quality Standards (Florida Legislature, 1996).
[3] Federal Ambient Water Quality Chronic Criteria (USEPA, 1988b and 1991c).
[4] From Appendix I, Table I-1. Only growth, mortality, and reproductive effects to plants, invertebrates, reptiles/amphibians, and fish were considered (USEPA, 1994d).
[5] This standard is based on human health effects.
[6] Value for aluminum as aluminum chloride.
[7] Value for cobalt as cobalt chloride.
[8] The value is based on an assumed site hardness concentration of 25 milligrams/liter (mg/ℓ) as calcium carbonate ($CaCO_3$).

Notes: ECPC = ecological chemical of potential concern.
RME = reasonable maximum exposure.
μg/ℓ = micrograms per liter.
FDEP = Florida Department of Environmental Protection.
AWQC = Ambient Water Quality Criteria.
AQUIRE = Aquatic Information Retrieval Database.
LC_{50} = lethal concentration to 50 percent of test population.
NA = not available.
TBV = toxicity benchmark value.
PCB = polychlorinated biphenyl.
DDT = dichlorodiphenyltrichloroethane.

exoskeleton are likely to prevent exposure. In any event, risks associated with the ingestion pathway, which was evaluated will far outweigh those other pathways under most circumstances.

- Risks to adult amphibians and reptiles species were not estimated for surface soil ECPCs because bioaccumulation and toxicity data for this taxonomic group are generally lacking in the literature. As a result, potential risks associated with ECPCs are uncertain for these species. However, it is unlikely that these receptors would be adversely affected at this site. For analytes detected in surface soil, the available literature suggests that amphibians are most sensitive to Aroclor and mercury. However, it is unlikely that these contaminants would pose a risk to these receptors at Site 16, as they would be less bioavailable in the surface soil medium, moreover sensitive life stages would not likely be exposed to surface soil. Intertaxonomic surrogates were not used to calculate dietary risks to reptiles and adult amphibian because of the uncertainty associated with extrapolation of data from endothermic to essentially ectothermic species.

- An assumption has been made that organisms evaluated in the surface soil toxicity tests are representative of species at the site. Depending on the sensitivities of terrestrial plants and invertebrates occurring at Site 16, risks may be over- or underestimated.

- Characterization of risks associated with ingestion of surface water by terrestrial wildlife is based on data from one surface water sample collected from the Site 16 ephemeral wetland. Depending on the conditions at the time of sample collection, the surface water data may not be representative of site conditions, and potential risks may be either over- or underestimated.

- The RTVs selected for evaluation of mercury at Site 16 were for organic forms of mercury (e.g., methylmercury). Because available literature indicates that methylmercury is generally more toxic than inorganic forms of mercury, it is likely that the Site 16 ERA overestimates risks from mercury. Although chemical speciation of mercury was not conducted, the available evidence suggests that site conditions are unlikely to result in the conversion of inorganic mercury to methylmercury. Therefore, risks to terrestrial wildlife associated with ingestion of mercury in surface soil may be overestimated.

- BAFs for plant material are based on the assumption that plants are 80 percent water. This assumption applies to berries and leafy vegetables, but does not apply to grains, which have a moisture content of only 10 percent. Since the diet of the cotton mouse consists primarily of grains, the risks to this receptor may be underestimated.

- There is uncertainty associated with the ingestion toxicity data derived from the Registry of Toxic Effects Chemical Substances (RTECS) database. The RTECS data were obtained in 1993, and the primary literature citation was not provided; therefore, the primary literature for these studies were not reviewed. This may have resulted in the selection of RTVs that may overestimate or under-estimate potential risks to wildlife receptors. RTVs for bis(2-ethylhexyl)phthalate, fluoranthene, phenanthrene, pyrene, cadmium, and lead were obtained from RTECS.

- There is uncertainty associated with risks to terrestrial plant and invertebrates from exposure to subsurface soil. Subsurface soil was not quantitatively evaluated in this ERA; however, deep-rooted plants and invertebrates, may have contact with this medium. Therefore, the following qualitative evaluation was conducted in order to evaluate subsurface soil. This evaluation is based on the comparison of analytes detected in subsurface soil with analytes detected in surface soil, ecological toxicity data, and ecological screening values.

- Several VOCs, SVOCs, pesticides and PCBs, and inorganic analytes were detected in subsurface soil. However, nearly all of the analytes in subsurface soil were detected at concentrations that were below the maximum detected concentrations in surface soil and which did not result in toxicity in the site specific assays. All of the pesticides detected in subsurface soil were detected at concentrations that were less than or comparable to concentrations detected in surface soil. The results of this ERA suggest that there would be no impacts to terrestrial invertebrate or plant communities, based on earthworm and lettuce seed germination toxicity tests conducted using site surface soil.

- Three VOCs and two SVOCs were detected in subsurface soil and were not detected in surface soil, however it is unlikely that they would pose a risk to plants or invertebrates due to the low frequency and concentrations detected. The inorganic analytes aluminum, copper, manganese, vanadium, and zinc were detected in subsurface soil at concentrations that exceeded maximum detected concentrations in surface soil and available screening toxicity data for plants and invertebrates. Aluminum and copper, and vanadium and zinc exceeded their respective screening values by three orders of magnitude and two orders of magnitude, respectively. The maximum detected concentration of manganese was six times the ecological screening value. Copper was the only analyte that was detected at a substantially higher concentration in subsurface soil (i.e., 3,620 mg/kg in subsurface soil vs. 202 mg/kg in surface soil). Based on this qualitative evaluation, deep-rooted plants and invertebrates may be at risk from exposure to these inorganic analytes in subsurface soil. However, there is uncertainty associated with applying surface soil benchmarks to this stratum.

<u>7.8 SUMMARY OF ECOLOGICAL ASSESSMENT FOR SITE 16</u>. Potential risks for ecological receptors were evaluated for ECPCs in surface soil, surface water, and groundwater at Site 16.

Risks associated with exposures to ECPCs in Site 16 surface soil and surface water were evaluated for terrestrial wildlife based on a model that estimates the amount of contaminant exposure obtained via the diet and incidental ingestion of surface soil and ingestion of surface water. Wildlife risks were evaluated by comparing the estimated doses for wildlife species (mammals and birds) to a reference toxicity dose representing the threshold at which lethal or sublethal effects may occur. Risks associated with ingestion of surface water by terrestrial wildlife were not identified; therefore, reductions in the survivability, growth, and reproduction of wildlife receptor populations that drink water from the Site 16 ephemeral wetland are not expected to occur. The estimated lethal risks to wildlife receptors from direct and indirect exposure to surface soil and food items were equal to or less than 1 indicating no adverse impacts to the survivability of wildlife populations at Site 16. With the exception of the cotton mouse, sublethal HIs for the representative wildlife species (e.g., red fox, short-tailed shrew, Eastern meadowlark, and the great-horned owl) did not exceed one for both RME and CT exposure concentrations. Ingestion of cadmium, and zinc in surface soil and food items are the primary contributors to the sublethal risks to the cotton mouse. Based on the results of the food-web model, reductions in the growth and reproduction of small herbivorous mammal populations at Site 16 are possible.

Risks to terrestrial plants and soil invertebrates at Site 16 were evaluated based on the results of laboratory toxicity testing, using earthworms (*E. foetida*) and lettuce seeds (*L. sativa*). There was no significant difference in the survival and growth of earthworms as compared to the site background and laboratory control samples. Therefore, reduction in the survival and growth of terrestrial invertebrate communities at Site 16 is not likely. Although a reduction in lettuce seed germination was observed in one surface soil sample (16S01201), there is no apparent correlation between the surface soil ECPC concentrations and the observed response. It is likely that a non-ECPC stressor (i.e., another physical, chemical, or biological stressor) is responsible for germination inhibition at Site 16. Based on the results of the lettuce seed germination toxicity test, reductions in the survival and growth of terrestrial plant communities at Site 16 are not expected. It is unlikely that terrestrial plants or soil invertebrates at Site 16 would be at risk from exposure to VOCs, SVOCs, pesticides and PCBs in subsurface soil, based on the qualitative evaluation of analytes detected in surface soil and available ecological screening toxicity data. However, several inorganic analytes detected in subsurface soil may present a risk to deep-rooted plants and invertebrates at Site 16.

Potential risks for aquatic receptors were evaluated for exposures to ECPCs in groundwater. Comparison of the RME concentrations of each ECPC with available criteria and toxicity benchmarks is the basis of the risk characterization. Several organic and inorganic analytes were detected in groundwater at concentrations that exceeded ecological screening benchmarks. Therefore, the potential for risks to aquatic receptors in Clear Creek associated with exposure to RME concentrations detected in groundwater at Site 16 may exist. However, the ERA for Site 39 will provide additional information regarding potential risks for aquatic receptors in Clear Creek based on actual site-related surface water and sediment data.

This ERA does not follow the step-wise procedure delineated in the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment* ("Process Document", 1997) for the selection of ecological contaminants of concern (COC). The procedures outlined in the "Process Document" state that the first-step in the selection of COCs should be a comparison to ecological screening values, prior to using any other screening tool (i.e., FOD, comparison to background, or identification as an essential nutrient). Therefore, the following evaluation was conducted to determine if the conclusions presented in this report would change if the most recent Process Document approach was followed.

In surface soil, Aroclor-1260 and antimony were eliminated from further evaluation, based on FOD and comparison to background, respectively. Several other analytes including calcium, iron, magnesium, potassium, and sodium were eliminated from further evaluation, as they were considered to be essential nutrients. Including these analytes in further evaluation would not have significantly changed the outcome of the ERA, as site specific toxicity testing indicated that the soils are not toxic to plants and invertebrates. In addition, the foodweb modeling showed that similar contaminants that were evaluated did not contribute significantly to the predicted risks at Site 16. In groundwater, the following analytes calcium, magnesium, potassium, and sodium, were eliminated from further evaluation because they are considered essential nutrients. All of the other analytes that were eliminated from further evaluation were eliminated based on comparisons to ecological screening values. Including the essential nutrients in the ERA for further evaluation would not have changed the outcome of this assessment. Surface water was screened using background concentrations only, because the available surface water screening values are protective of aquatic receptors, which are lacking from the habitat where the single surface water sample was collected. The essential nutrients calcium, magnesium, potassium, and sodium detected in surface water were eliminated from further evaluation. The analytes that were eliminated from further evaluation based on comparisons to background included barium, beryllium, iron, manganese, and zinc. Based on the HIs, calculated for the two analytes retained as surface water COCs, it is unlikely that including any or all of the analytes detected in surface water would have changed the conclusions of the ERA.

In summary, the results of the ERA suggest that only sublethal risks (i.e., reductions in growth and reproduction) to small herbivorous mammals are predicted. These risks are likely associated with ingestion of cadmium and zinc in surface soil and food items that have bioaccumulated these inorganic constituents.